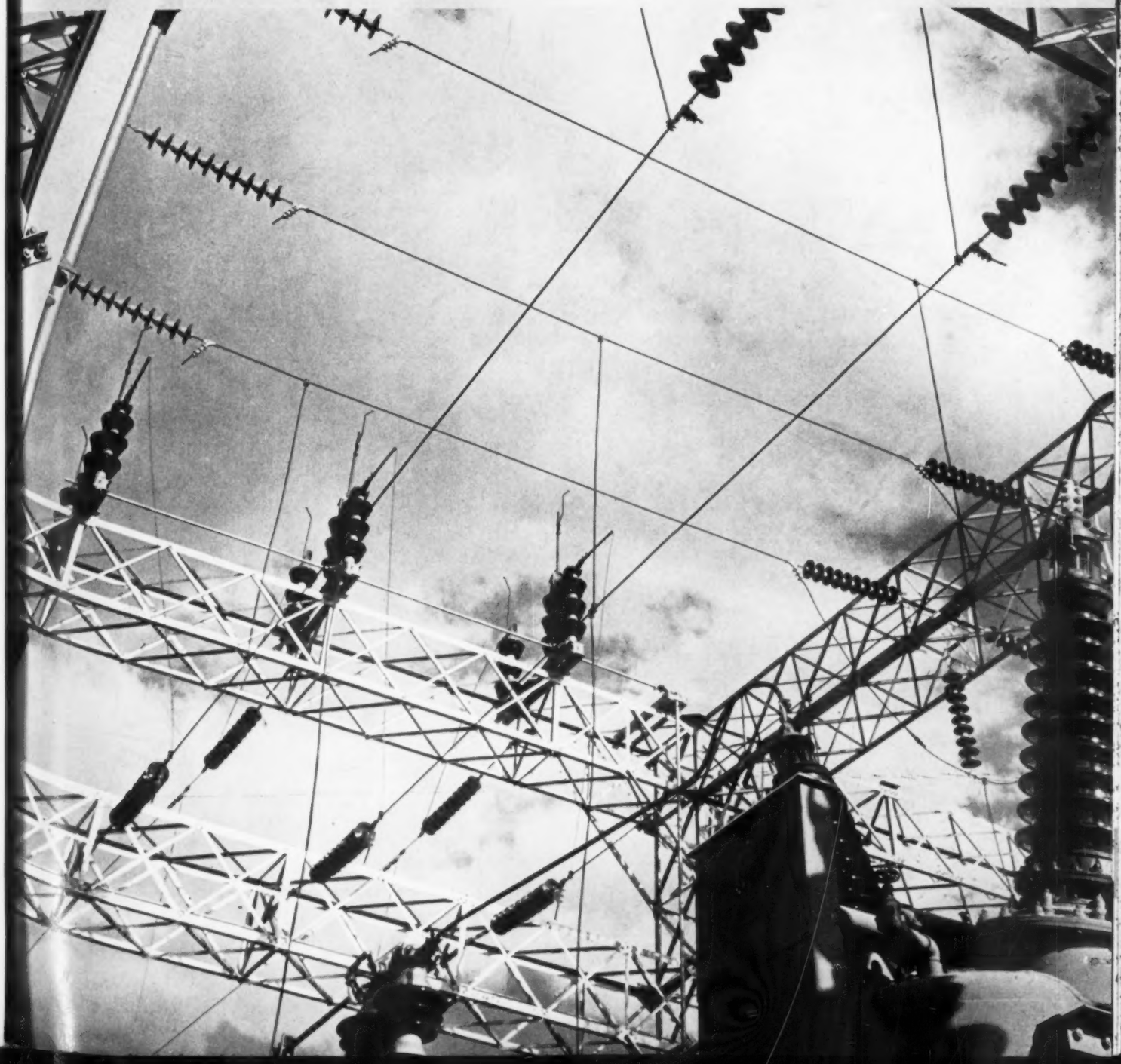
2ND ANNUAL REVIEW & FORECAST • FEBRUARY 1941 • 25¢

ELECTRICAL WEST

THE ALL-INDUSTRY MAGAZINE OF PROGRESS



The trend is to electric ranges...

ELECTRIC COOKING Bargain!
Your Choice of these two famous ranges
ONLY $4.99 PER MONTH
With Low Down Payment
Liberal Allowance on Your Old Range
You Get Thrifty Electricity, Too!
ASK ABOUT THE VERY LIBERAL WIRING ALLOWANCE
At Your Dealer Now!
With All These Modern Cooking Advantages
THE Westinghouse "HARVESTER"
THE Hotpoint "PRESIDENT"
SOUTHERN CALIFORNIA ALL-WINTER SUN FESTIVAL

★A few years ago only one in every fifteen ranges sold was an electric range. But times have changed! Now every fourth range sold is electric, and the swing to electric cooking is steadily increasing. In 1941, more homes will be equipped with electric ranges than ever before, and Edison advertising again will support the sales efforts of every electrical dealer in Edison territory.

ELECTRIC COOKING Bargain
Your Choice of these two famous ranges
ONLY $4.99 PER MONTH
Liberal Allowance on Your Old Range
ASK ABOUT THE VERY LIBERAL WIRING ALLOWANCE
At Your Dealer Now!

HURRY, HURRY, HURRY FOR THIS
Big ELECTRIC COOKING BARGAIN
TWO FAMOUS MAKES
Liberal Trade-in and a Very Low Monthly Price
$4.99 PER MONTH
ASK ABOUT THE VERY LIBERAL WIRING ALLOWANCE
At Your Dealer

LIBERAL ALLOWANCE FOR YOUR OLD RANGE
These Famous ELECTRIC RANGES ONLY 4.99 PER MONTH
With Low Down Payment
THE Westinghouse "HARVESTER"
THE Hotpoint "PRESIDENT"
Ask about the Very Liberal Wiring Allowance
At Your Dealer Now!

SOUTHERN CALIFORNIA Edison

ELECTRICAL WEST (with which is consolidated The Journal of Electricity), February, 1941. Vol. 86, No. 2. Published monthly by the McGraw-Hill Company of California, 68 Post Street, San Francisco, Calif. Entered as second class matter at the post office at San Francisco under the Act of March 3, 1879. Additional entry as second class matter at the post office at Los Angeles. Printed in U. S. A. Subscription rate in U. S. and U. S. possessions, and Canada, $2 per year; all other countries $3 gold (thirteen shillings). Single copy 25c.
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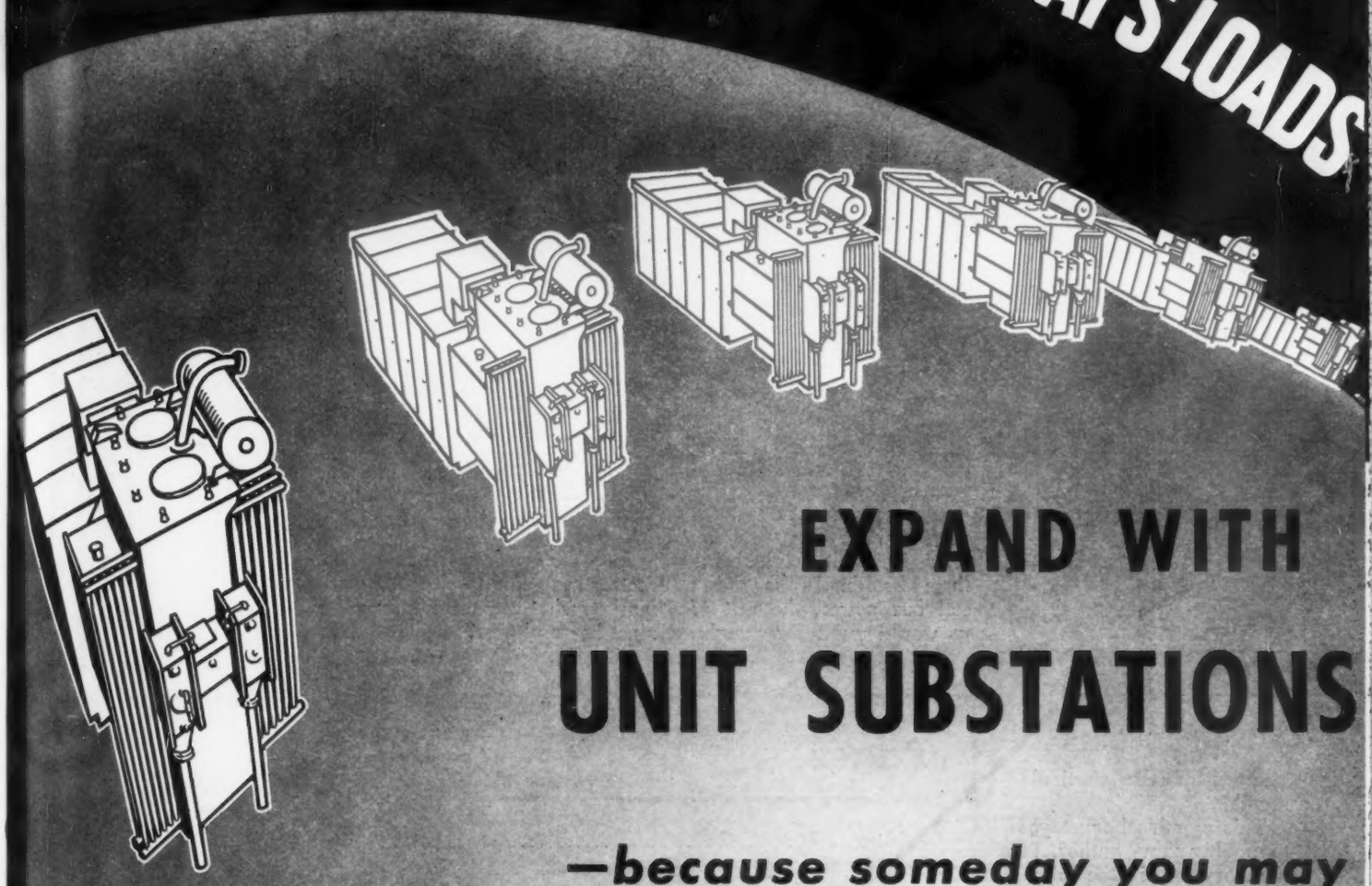
FARSIGHTED WAY TO SUPPLY TODAY'S LOADS



EXPAND WITH UNIT SUBSTATIONS

—because someday you may want to move them

YOU'RE looking ahead when you install G-E unit substations. With them, you can add substation capacity, in small increments, *where* you want it *when* you want it. Equally important, you can move it to new, more effective locations when load conditions change. You will never have a large investment "frozen" in idle equipment.

You save secondary copper, reduce line losses, provide better voltage and better service, because you can install unit substations at the center of load areas. Installation is a matter of days, not weeks.

Add up all these advantages. We think you'll agree: for the changing power requirements of both today *and* tomorrow, G-E unit substations offer the practical, farsighted solution. Your local G-E representative can furnish you with complete information—or write for Catalog GEA-2996. General Electric Company, Schenectady, New York.

GENERAL ELECTRIC

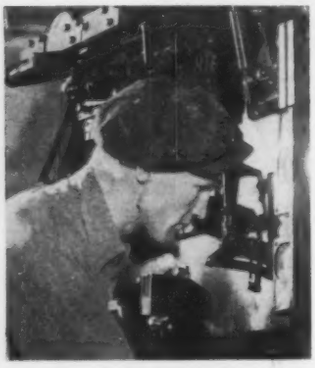
Here in the WEST

People

Ghost Writers

This month Electrical West tells a story of progress—work done in 1940, work scheduled for 1941.

Every month ELECTRICAL WEST tosses the bouquets in this column to two or three



Mr. A

authors of the particular month.

This month's boquet goes to no big-name author, for the story told in the following pages has been written by no particular man, but

Mr. B

by the thousands of men who have been laboring, engineering, selling, contracting and what not, in order that electricity can be put to use.

So we give you Mr. A. He has built new plants. He has kept the old ones in shape. He has climbed out of bed in the middle of a freezing cold night, many a time, to fight storms and floods and nature at large—in order that hospitals might not be short of warmth, or defense industry short of power. In order that you and I might not fumble in the dark.

And we give you Mr. B. He fills our pay envelope. All year he keeps telling people how power can be put to use, how it can preserve their eyesight and bring them health. If he didn't sell our power, the rest of us would work for nought.

Pages

Grand Show of Appliances 10
Preview of the new models—pictures and highlights on changes and additions.

ANNUAL SURVEY

This Year of Grace 41
The year's electrical statistics, what they mean, and how they bear on national defense.

Construction for '40 and '41 44
Detailed reports for plant expansion programs of more than 50 Western systems and projects

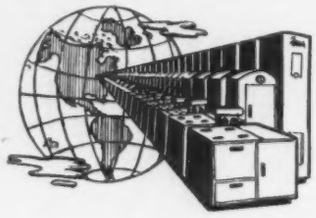
Sales Picture for '40 and '41 60
Detailed by systems. Units sold, quotas, and numerous other basic data

Magazines in Review 4
Books 8
New Products 10
Bulletins, etc. 30
Electra's Husband 34
Engineering 44
Sales 60
Editorials 78
Sales Guide 81
Lighting and Wiring 86
Associations 95
News 100

Preview

New Angles

This month's issue takes sales figures for 1940 and 1941, digests them, presents the facts. One question remains unanswered: What is the new slant?



In other words, what new factors are going to alter the market, what new techniques must be employed?

Half a dozen Westerners who are in the know will tell, next month, about new aspects of merchandising water heaters, refrigerators and ranges.

How to Sell

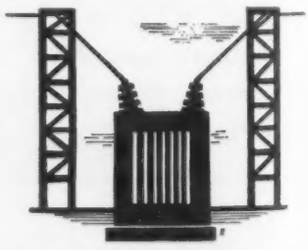
Each month the Sales Guide carries across-the-counter sales help which can be put to use by all kinds of dealers, large and small. Subject for the Sales Guide for March will be the electric range.

Relays

E. B. Kipp of Westinghouse has been writing a series of down-to-earth articles about relays, designed especially for electrical men who only occasionally encounter relays in their work. He skips this month because the issue is devoted to construction budgets. But he'll be back next month with his concluding piece.

System Ties

Interconnections are making news these days. An engineering discussion of the



practical aspects of a typical inter-connection will appear under engineering.

Directory

April will contain a Manufacturers' Directory, published annually, listing all electrical manufacturers, their Western office and representatives.

"If you can change... this bracket...?"

30 YEARS OF 1911 L·M 1941 Service LINE MATERIAL COMPANY

THIRTY YEARS AGO a man walked into the offices of a leading utility with a piece of pole line hardware under his arm.

He showed it to the buyer, explained its construction and asked for an order.

The buyer examined it, asked the price and then remarked, "If you can change the angle of this bracket, I'll give you an order." The man said, "I can and will!"

That was the start of the Line Material Company—thirty years ago.

That man's unhesitating readiness to comply with a customer's request is still the basic policy of the Line Material Company.

Theodore Roosevelt once said, "Everyone owes something to the industry of which he is a part."

Here, at Line Material, there is a feeling that we have contributed much to the utility industry.

Our continuous growth from 1911 to 1941—thirty years—seems to prove that fact.

Today, Line Material means much more than pole line hardware. It means distribution transformers, lightning arresters, fuse cut-outs, street lighting, underground and other equipment essential to the distribution of electrical energy.

The position which the Line Material Company occupies today is unique. This company is neither so small as to be limited in the degree of service it can render, nor so large as to be cumbersome.

In other words, its line of products is sufficiently broad; its engineering ability is alert and its standards are high.

Its service is all that a nationwide chain of sales offices and warehouses imply.

In short, you should consider the Line Material Company.

LINE MATERIAL COMPANY

A Complete Line of Electrical Transmission Distribution and Street Lighting Equipment

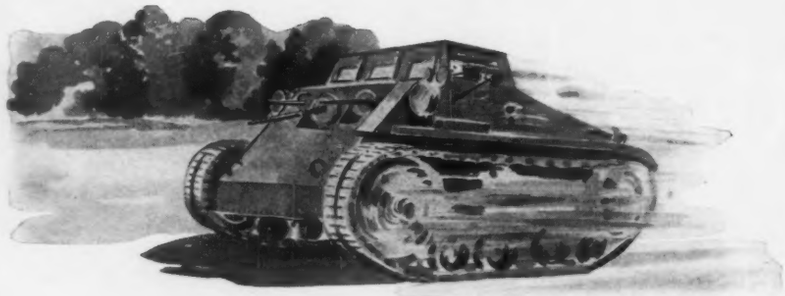
General Offices: Milwaukee, Wisconsin

Plants: South Milwaukee, Wisconsin • East Stroudsburg, Pennsylvania • North Birmingham, Alabama
Oneida, New York • Zanesville, Ohio • Gary, Indiana • Barton, Wisconsin • Toronto, Ontario, Can.

Sales Offices in thirty-seven cities . . . Warehouses in fifty-one cities

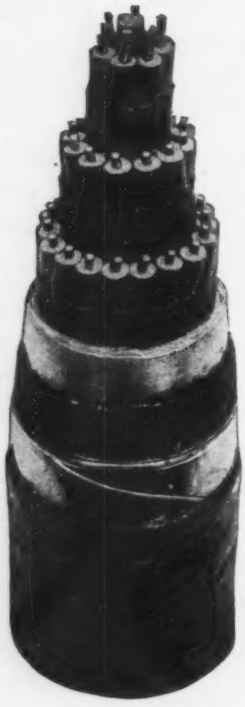
RUBBER COVERED POWER CABLES • BUILDING WIRE
ARMORED CABLE • FLEXIBLE CORDS • LEAD ENCASED AND PARKWAY CABLES • VARNISHED CAMBRIC
CRESFLEX NON-METALLIC SHEATHED CABLE • SERVICE ENTRANCE CABLE • MAGNET WIRE • BARE WIRE

INDUSTRY SPEEDS DEFENSE



with much of the POWER supplied by

CRESCENT CABLES



With increasing power needs threatening existing load capacities, look to CRESCENT'S comprehensive line of cables, a few of which are:

- RUBBER POWER CABLES
- SIGNAL CABLES
- CONTROL CABLES
- VARNISHED CAMBRIC CABLES
- PORTABLE CABLES
- PARKWAY CABLES
- BUILDING WIRE and CABLE

CRESCENT INSULATED WIRE & CABLE CO.

CRESCENT WIRE and CABLE

Factory: TRENTON, N. J.—*Stocks in Principal Cities*

CRESCENT ENDURITE SUPER - AGING INSULATION

MAGAZINES
quick in review

● Year's beginning is the time for reviews and surveys in the technical magazine field. Just as this issue of ELECTRICAL WEST digests the figures for the Pacific Slope, the national magazines deal with data for the nation as a whole.

Most authoritative compendium of facts for the nation's utilities will be found in the 37th Annual Statistical Number of *Electrical World*. Here is most every basic fact the electrical reader will want to lay his finger on with reference to such topics as "Output," "Energy Sales," "Station Economics," etc., all set up for quick reference.

Electric Light & Power attempted no such comprehensive job, but did present one rather interesting spread, showing a sort of flow diagram indicating the gross revenues of private and municipal systems and where those moneys were spent.

For a review of the year's developments in power, industrial, transportation, illumination and research branches of electricity, see the January issue of General Electric *Review*, which is turned over almost in its entirety to electrical progress in 1940.

And an Appliance Survey

Twentieth annual statistical and marketing issue, *Electrical Merchandising*, is packed solid with figures on electric appliance sales and opportunities from 1931 to 1941. Pages on saturation or acceptance by states and regions may be disputed in some items. Figures evidently are based on manufacturers' production records and shipments to the West during the past 10 years. However, as the only national attempt to arrive at such figures, this issue should provide a better base from which to start than anything so far developed. Figures for the West in comparison with other regions of the United States will prove of keenest interest and possibly be questioned the most.

On Using Appliances

"Three company dinners, cook them in the electric roaster," by Kathleen Robertson, will be one of three feature articles on electric appliance use in the March *McCall's*. Another page will be about the electric laundry and the third feature is on electric waffle recipes. Each of these can be used definitely as appliance promotion pieces for mailing or window cards.

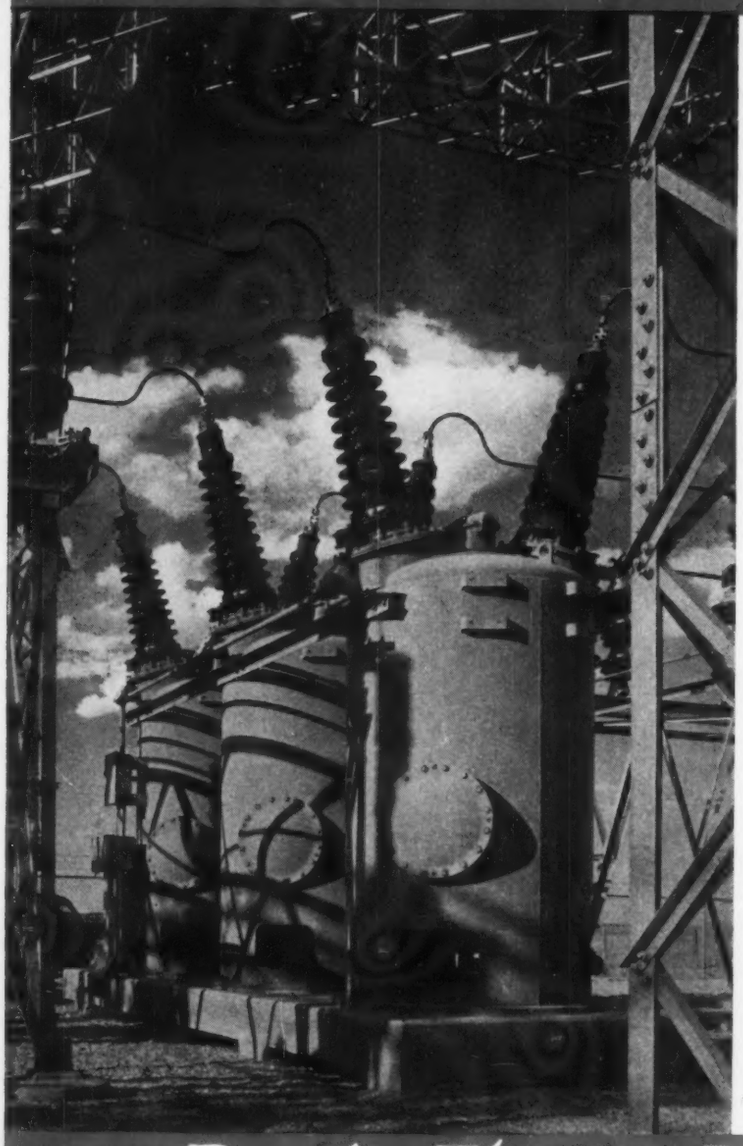
Street Lighting

"Recommended Practice of Street Lighting 1940", *Illuminating Engineering*, January, p. 17, as well as "The Use of Radiant Energy for the Application of Heat", p. 61, and "Operating Advantages of Controlled Conditions Plant", p. 99, are three timely and useful articles in these respective fields.

PACIFIC ELECTRIC BREAKERS

WIN FRIENDS *in Wyoming*

Provide Quick Safe Interruptions, and Fast Closing because of Quick Arc-Extinguishing Devices and Motor Control



Wyoming Installation
TYPE RWE-58, 115-kv., 600 amperes

Reliable protection reduces outages, gives better continuity of service, pleases the people.

Quick, safe interruptions with fast opening, closing and reclosing are provided with our exclusive spring-actuated motor control which offers perfect synchronizing, saves money on installation and will operate direct on AC without unreliable rectifiers—or will operate on DC with small batteries.

You save on upkeep, have no bother, less oil carbonization, no oil throw and less frequent servicing of contacts because of our exclusive expulsion chambers.

You get the finest bushings; bevel-link drive which assures perfect alignment and freedom from faulty operation; you get N.E.M.A. and A.I.E.E. Standards; and long low-cost service with utmost safety—Pacific Electric's 35 years of specialized manufacturing experience assures that! High-accuracy bushing-type current transformers are available for metering purposes. Get all the facts — how Pacific Electric breakers win public approval for your utility by helping give better continuity of service.

C. H. Cutter
1006 Securities Bldg.
Seattle, Wash.

U. N. Halliday
230 U. S. Nat'l. Bank Bldg.
Denver, Colo.

G. B. Kirkwood
437 S. Hill St.
Los Angeles, Calif.

Northwest Supply Co.
910 S. Arizona St.
Butte, Montana

J. E. Redmond Co.
448 W. Madison St.
Phoenix, Ariz.

R. Ackerman
318 Dooly Block
Salt Lake City, Utah

Other Representatives in Principal Cities

Pacific Electric Mfg. Corporation

5815 THIRD ST., SAN FRANCISCO, CALIF. DUNES HIGHWAY, GARY, INDIANA

More

Here's Greater Value AT NO EXTRA COST!

1. Revolutionary Cadmium-plated 3-Way Terminal Cuts Installation Time... Simplifies Wiring Job... Minimizes Electrolytic Action on Copper or Aluminum Conductors.

2. New, Durable Steel Tank, Tested Under Pressure... Prevents Oil Leakage... Assures Long Life.

3. New Spra-bonderizing... Plus Triple Coat Automobile Finish... Gives Positive 4-Way Rust Protection.

4. Double Conductor Insulation Provides Double Safety Against Winding Failures.

5. Time-proven Core and Coil Construction... Designed for Years of Efficient, Service-free Operation.

6. Extra-heavy Porcelain Coordinated Bushings with Liberal Creepage... Offer Maximum Reliability Under Fog, Dust, Chemical, or Other Adverse Operating Conditions.

ALLIS-CHALMERS DISTRIBUTION

MONEY-SAVING FEATURES!

New Allis-Chalmers Distribution Transformer First With Cost Cutting Improvements!

Added quality in every detail . . . added design features that point the way to greater all-around dependability at lower costs — that's the new Allis-Chalmers Distribution Transformer . . . on the market today!

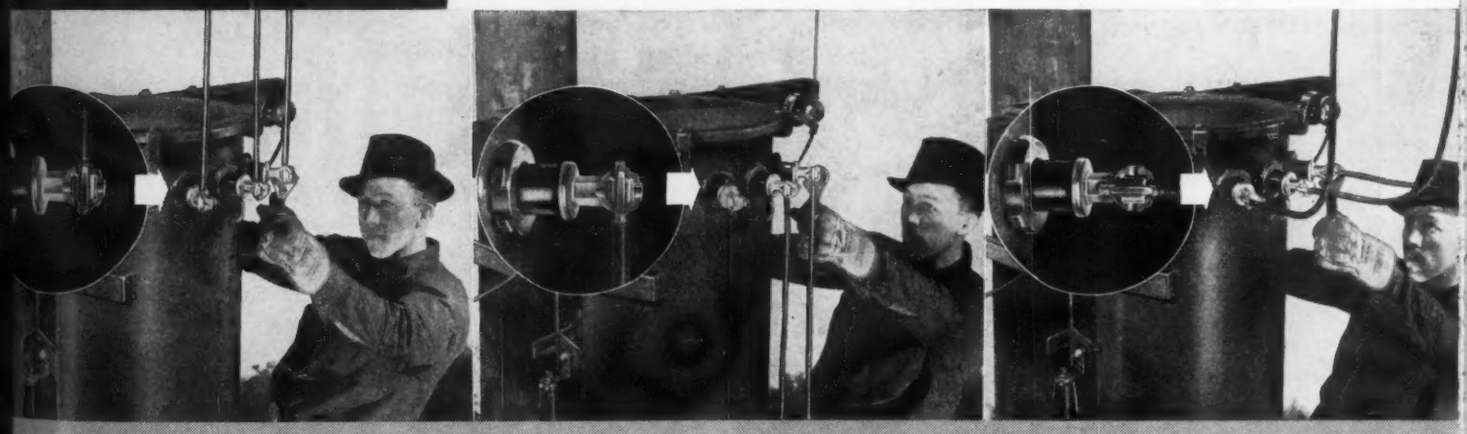
With the big cadmium-plated 3-way terminals you save man hours . . . eliminate complicated wiring jobs.

Equally important . . . you don't have to buy special fittings . . . for the heavy cadmium plating not only reduces corrosion . . . but at the same time actually minimizes electrolytic action when used with copper or aluminum conductors.

What's more, there's new design perfection of core and coils . . . dictated by over 40 years of Allis-Chalmers experience in building distribution and power transformers for utilities all over the world. All windings are double insulated for added safety — double protection against winding failure.

But that's only part of the story! This new Allis-Chalmers Distribution Transformer . . . with all its money saving features costs no more than ordinary distribution transformers.

For complete information . . . call the nearest Allis-Chalmers District Office . . . or write Allis-Chalmers, Pittsburgh Works, Pittsburgh, Penn.



SEE HOW THE NEW 3-WAY TERMINAL WORKS! Perfected 3-Way Terminal is standard equipment on all new Allis-Chalmers Distribution Transformers. First and second pictures show how simply and easily leads can be brought to the transformer from both top and bottom. But you don't stop there! For in the third picture is illustrated an *extra* advantage you get with no other terminal! If necessary . . . leads can be brought straight out from the transformer . . . without making an extra bend in the conductors or complicating the wiring job. Notice how the tightening tool travels in an *up and down* direction eliminating the chance for accidental short circuits across the secondary terminals. Notice, too, that a standard line-man's wrench is used. No special tools are needed. You don't have to buy extra fittings. Heavy cadmium plating of the 3-Way Terminal makes it possible to be used with *both* copper and aluminum conductors with a minimum of electrolytic action. A-1231

ON TRANSFORMERS *Cut Operating Costs*

PRINT IN BINDING

TORK CLOCKS

THE POPULAR TIME SWITCH LINE KNOWN EVERYWHERE

NOW—lower prices and higher capacities

There is a Tork Clock for every regular switching job: 60 minute, 4 hour or daily cycles.

Bulletins on request

THE TORK CLOCK CO., Inc.
MOUNT VERNON, N. Y.

Representatives:
A. R. Slimmon, 445 E. 3rd St., Los Angeles
Geo. H. Curtiss, 540 McAllister St., S F.
H. M. Sayers, 1019 Eastlake Ave., Seattle
Stevens Sales Co., 41 P. O. Place, Salt Lake City

ELECTRICAL TESTING LABORATORIES

Electrical Photometrical, Chemical and Mechanical Tests. Inspection of Materials and Apparatus at Manufactory.

2 East End Ave. New York

THE WEST GROWS FASTEST

The West is the region where: One-tenth of the nation's people use one-fifth of the nation's electricity; Electric rates are the lowest in the world; Great natural resources (involving 40% of the nation's area) await exploitation. Census data bear out the statement that the West is the fastest-growing electrical market. For further information about this big, fast-growing market, and how to reach it, call an ELECTRICAL WEST representative:

Chicago—W. B. Heaps, Whitehall 7900
Detroit—S. H. Babcock, MA 6024
New York—Ralph H. Flynn, Medallion 3-0700
San Francisco—Roy N. Phelan, Douglas 4600

For the Layman

"How Man Harnessed Electricity", *U. S. Steel News*, January, 1941, p. 1. This is a quarterly magazine, and the January issue was turned into an Electrical Number. "How Man Harnessed Electricity" goes from A to Z in one easy lesson. Written for the non-electrical man, it is so simply put together that electrical men will be interested in reading it, too. Similar non-technical electrical articles fill the entire issue and may make interesting studies for those who have to deal with customers, employees or others who are not "electrically minded".

Portrait

Fred C. Todt, Los Angeles district manager of G-E Supply Corp. is the "Man you should know" in *Wholesalers Salesman*, January, p. 46; "How Portland Wholesalers Build Bigger Appliance Sales", p. 20, and "In Fluorescent—Sell Quality and You'll Get the Price", p. 24, are also well worth reading.

Cafe Lighting

In *Architect & Engineer*, December, is described a new short-order cafe at Jantzen Beach Park in Portland lighted largely by fluorescent lighting equipment.

Radiant Heat

"Radiant heat—full-fledged industrial tool," *Electrical Engineering*, January p. 3. For moderate temperature heating application, radiant heat produced by incandescent lamps is rapidly replacing convention heating for many drying, baking, dehydration and other processes according to the author. The charts which accompany are valuable in computing installation capacities and other factors for different types of application. The author concludes with this significant statement: "Few developments in the last decade have been as revolutionary or have offered such promise for future expansion of the electrical industry as this one."

For Appliance Salesmen

"Your Coffee is Marvelous," another of Kathleen Robertson's compact appliance-use stimulators will be in *McCall's* for February. The same issue will contain a hint for use of automatic electric irons in the pressing of foundation garments. Both are good sales gossip for appliance sales people to use.

Cost of Contracting

"What do you offer your customer?", *Qualified Contractor*, January, p. 9; Research engineer, Ray Ashley, of the Electrical Contractors' Assn. of the city of Chicago, breaks down for selling purposes a comparative cost to an owner of doing construction work with his own crew as against subletting it to an electrical contractor. A very much needed piece of research in a field in which too little of this kind of information is known. Another advantage to contractors is pointed out on page 29. Intermittent employment under the California Unemployment Compensation Act makes it unwise for a factory to attempt occasional construction work on its own.

Contracting for Defense

"Defense Business—Where Is It?", *Electrical Contracting*, January, p. 15, Editor Earl Whitehorne summarizes the returns from a nation-wide survey of defense construction and tells what part electrical contractors can expect in this program. "We Wire Farms", p. 22, will find wider interest among average contractors in the West.

BOOKS
you may want

CHAMBERS' TECHNICAL DICTIONARY edited by T. F. Tweney and L. E. Hughes, published by the MacMillan Co., New York, $5, with over 50,000 entries in one volume, covering all branches of modern science and industry, including terms resulting from recent research in both English and American terminology. Such a dictionary as this has been long needed. Terms used in pure and applied science, medicine, the chief manufacturing industries, engineering and all of its various branches, construction and the mechanical trades are included. Such words are seldom found in ordinary dictionaries and sometimes only with difficulty in handbooks. Fields of interest to the electrical industry include radiology, television, mechanics, surveying, hydraulics, instruments, illumination, heating, telephonics, optics, acoustics, fuels, structures, mathematics, as well as electrical and illuminating engineering. Useful, also, are the terms in related industries in which electricity is applied.

NATIONAL ELECTRICAL CODE HANDBOOK, by Arthur L. Abbott, 5th edition published by McGraw-Hill Book Co., New York City, $3. With its radical changes, the 1940 national electrical code probably needs such a book as th's more than any previous code for some years. With simply stated background reasoning, the entire code is made understandable and the interrelation of its various rules ingeniously worked together in a simplified chapter arrangement. Such explanations as those on page 31 treating with ambient temperature in a sensible, clear-cut manner make the volume invaluable because they brush away confusion and provide practical working bases for wiring installation.

LETTERS
to the editor

To the Editor:

Taking an idea from the cover of November issue of the ELECTRICAL WEST, we have

put it in form of a window. In which, I am sending you a picture.

We use this magazine extensively in our organization.

DALE D. MORRIS,
C. C. Anderson Co.
Burley, Idaho

Red Hot News!

EXTRA

Hotpoint News

EXTRA

DEALERS MAKING BIG 2-WAY PROFIT ON HOTPOINT CALROD ELECTRIC RANGE REPLACEMENT UNITS!

SMASHING PRICE REDUCTIONS!

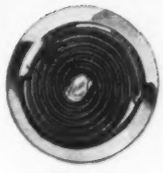
UTILITY SIZE
WAS $7.00 .. NOW $5.95

GIANT SIZE
WAS $9.00 .. NOW $7.95

(Prices include stainless steel adapter rings)

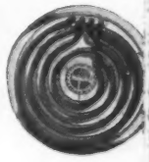
Fit practically all makes of electric ranges with Hotpoint Calrod's minimum number of Adapter Rings . . . cut your inventory . . . increase your turnover . . . save stockroom space and make good profits!

A RED-HOT MARKET is waiting for Hotpoint Calrod Replacement Units—a 2½ million market! There are that many old-style electric ranges that need modernization and will welcome cooking with Calrod's "Measured Heat." Important new price reductions on these famous nationally-advertised units open wide the door to more and more sales of new electric ranges, too, dealers are finding. First, modernize old ranges. Second, sell new Hotpoint Electric Ranges. Make a Two-way Profit! Try this "Measured Heat" sales tonic in your territory. Get in touch with your Hotpoint distributor or district representative. Edison General Electric Appliance Co., Inc., 5612 West Taylor Street, Chicago, Illinois.



OLD

SELF-CLEANING
FASTER
MORE EFFICIENT



NEW

YOU CAN SEE THE DIFFERENCE!

Cash in on the great National Advertising Campaign Hotpoint has launched on the new 1941 Hi-Speed Calrod. There's a big public interest in "Measured Heat"—and your customers are already sold on Hotpoint. And a pre-sold customer is twice as easy to sell a new range or replacement unit!

Hotpoint Calrod

ELECTRIC RANGE SURFACE UNITS WITH INCONEL SHEATH AND BUSHING GLASS-SEALED TERMINALS

Our Banking Service Right at Your Doorstep

You don't have to bring your business to us to enjoy the facilities of this old, metropolitan bank. Rather, we take our services to you—by mail—no matter where your business is located. Our Bank-by-Mail Service will save your time; perhaps money, too. Why not open an account today, by mail?

CROCKER FIRST NATIONAL BANK
OF SAN FRANCISCO
California's Oldest National Bank
Member Federal Deposit Insurance Corporation

Super IS THE WORD FOR THEM!

CHROMALOX
RANGE UNITS

Super-Speed—Cooks food as fast as food will cook.
Super-Economy—Two-units-in-one and low-cost contact cooking.
Super-Cleanliness—Flat top makes easy cleaning.
Super-Sales—Chromalox popularity and past performance make more range sales. Write for complete information.

MONTGOMERY BROTHERS
911 Western Ave., Seattle, Wash.
2333 N.W. Westover St., Portland, Ore.
61 Fremont St., San Francisco, Calif.
420 S. San Pedro St., Los Angeles, Calif.
THE PETERSON COMPANY
1921 Blake St., Denver, Colo.
EDWIN L. WIEGAND CO.
7540 Thomas Blvd., Pittsburgh, Pa.

PRODUCTS *that are new*

Grand Show of 1941 Appliances

Westinghouse Mobilaires

Slightly larger than a table model radio, with a price about the same as that of an ordinary room cooler of the same capacity, the new Westinghouse Mobilaire plug-in air-conditioner puts a summer air conditioning system in reverse, heating the room by extracting heat units from outside air and drawing them indoors, or extracting heat from the room air and discharging it outdoors. It has a capacity of 6,000 cooling units and 7,500 heating units an hour, using a dial control to bring in fresh air and expel stale air. The heating feature of the new air-conditioner will be particularly useful in the "in-between" seasons and in mild climates it can be used for cooling or heating the year round.

Three other air-conditioning models are put out without the heating feature, none of them require plumbing connections and the entire line is powered by Westinghouse hermetically-sealed system, backed by a 5-year warranty.

Westinghouse Refrigerators

Topped by the Martha Washington model, styled in a colonial mode and stressing pastel colors in the interiors, the Westinghouse refrigerator line eliminates the 5-ft. models and adds 7- and 9-ft. models by consumer demand. True-Temp Control is the basic improvement in design which maintains interior temperature regardless of room temperature and holds correct temperature and humidity levels for the five cold zones. The Trip-Lok is an added convenience, automatically shutting the door, and on a few models the Aero Spring Hinge has been introduced which permits the door to remain open at any desired distance until the hinge is tripped when the door automatically closes. Two High Humidity models have the Humichest which permits uncovered storage of high-water content foods. Three models are available with porcelain exterior. Price range in the West runs from $119.95 for the Special 6 to $219.95 for the Martha Washington deluxe 7. A clever visualizer by which to sell the color to match a kitchen is also available as a sales help.

Westinghouse Ranges

Automatic single set switch for surface unit timing, streamlined design and larger oven space are marked improvements in the 1941 Westinghouse ranges. The single set switch makes possible automatic surface cooking, permitting, by one setting of the switch, a selection of time cooking at high temperature and at four lower heats. Another function of

Westinghouse: (above) Mobilaire and range, (below) refrigerator and laundry

Life's Happiest Hour : : : : BY WEBSTER

THANKS FOR THE ORDER, NOW YOU'RE ALL SET TO DO SOME REAL FAN BUSINESS THIS SUMMER
G-E FAN PORTFOLIO
A DISTRIBUTOR SALESMAN GIVES A FAN DEALER A POWERFUL BOOST TOWARDS HOT WEATHER PROFITS
Webster

Sell the Fans with the Popular Name—G-E—and Benefit from This Strong Promotion

Here's the big fan news for 1941! A new group of G-E Fans to sell at lower prices!

G-E Fans are 'way up there in sales every year. Because they're known through advertising. Because they're pushed by powerful promotion. Because the public accepts them as tops. Because they're the most complete line of fans in America.

Now, with this new low-price group, G-E Fans will move faster than ever—bring you more profit than ever! Get the cheerful story from your G-E distributor salesman. Hitch up with the leader and go to town with G-E fans this summer!

Fan Sales Section, Appliance and Merchandise Department, General Electric Company, Bridgeport, Connecticut

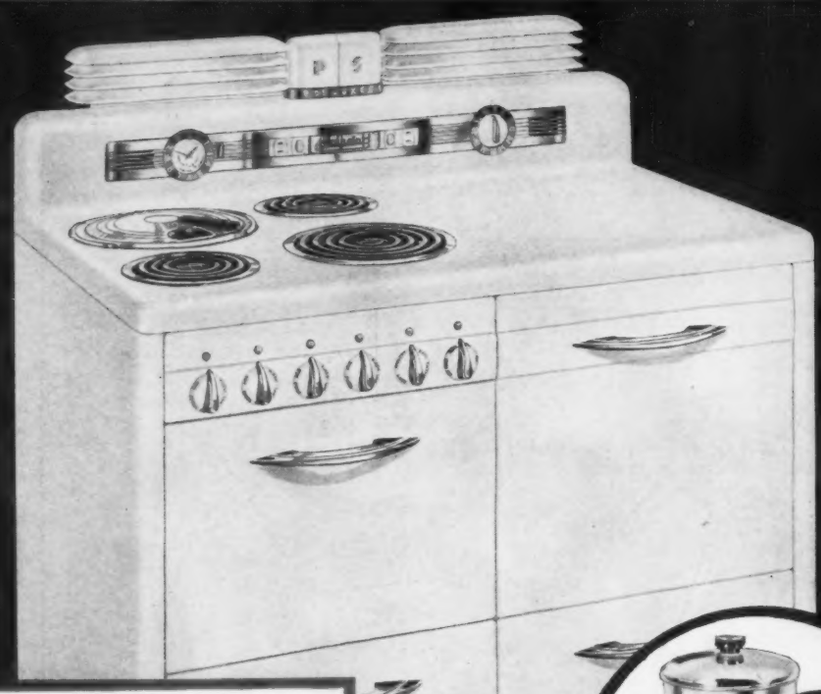
YOU GET ALL THIS POWERFUL PROMOTION *FREE!*

1. A 10-color action *Window Display* that will stop 'em, hold 'em and sell 'em.
2. Handsome *Catalogs* crammed with facts and illustrations that build sales.
3. Direct *Mail Pieces* that "get in the door" of homes, stores, offices.
4. Local newspaper *Ad Mats* that help you sell when your market is "hot."
5. Powerful National *Newspaper Ads* in over 175 key cities—run when you need them—in local hot weather.

GENERAL ELECTRIC

PRINT IN BINDING

A Brilliant New Line of



$219.50 F.O.B. Factory Chicago

INSTALLATION EXTRA

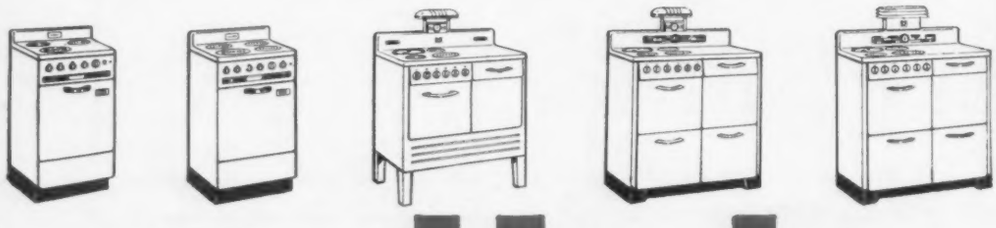
Other Models as low as $89.95 at the factory

New Tiffany Stainless-steel Copperclad 3-piece utensil set included with this new range.

The NEW TIFFANY Super De Luxe Model

Acknowledged Style Leader Among Ranges

- 3 New Hi-Speed Calrod Surface Units, each with 5 Measured Heats.
- All-Porcelain enamel inside and out.
- Beautifully styled Twin Venetia-Lite Lamps.
- Built-in Electric Oven Timer-Clock and Time Chime.
- Oversize, All-Purpose, Flavor-Seal Oven with interior light.
- New illuminated Switch Dials.
- Two Appliance Outlets—one Timer controlled.
- New Calrod Baking Unit with new Heat Deflector.
- New Duo-Speed Broiler—with new Broiling or Roasting Pan.
- Warming Compartment for foods and dishes.
- New 7-Quart Flavor-Seal Thrift Cooker with 5-Heat Calrod Unit.
- Tiffany Set of Copperclad, Stainless-Steel Utensils.



Lowest Prices, Greate alue

ONCE MORE Hotpoint sho omoti the way to bigger volume a ogram bigger profits with two brilli res. leaders in a greater-than-ever li neral Seven sensational new elect 12 W ranges, all with the *Measured He* that brings new standards of pe formance to electric cooking. S the complete line, then ask abo Hotpoint's helpful, exclusive sal

News! Price Reduction on Calrod Electric Rang Replacement Units!

UTILITY SIZE WAS $7.00 NOW $5.9

GIANT SIZE WAS $9.00 NOW $7.9

(Including stainless steel adapter ring

Surveys show 2½ million electric ranges are ripe for modernization. Dip into this rich new market with the Calrod Replacement Plan. You get a 2-way profit by (1) modernizing old ranges and (2) making new range sales. A minimum number of adapter rings are needed to fit practically all makes of ranges.

OLD **NEW**

You Can See The Difference. The Lighter, Faster, Self-Cleaning Calrod for '41—A Great Sales-Opener!

THE NAME EVERYBODY KNOWS

Hotpoint

OTPOINT ELECTRIC RANGES

alues in 31 Years....

motion plan, which includes a new ogram for selling with motion pic-res. Do it today — now! Edison neral Electric Appliance Co., Inc., 2 West Taylor Street, Chicago, Ill.

Thoughts at a Glance

It has been said that every young man in America is granted three birthrights — ideas, ideals, and a belief in opportunity.

It always has seemed to me that so long as a young man has these three convictions, he can forge ahead. The same thing is true of a business organization: so long as the men responsible for its direction retain their belief in the value of ideas, in the integrity of ideals, and in the genuineness of opportunity that organization can progress. It is a sign that it still is young in spirit.

From the beginning, Hotpoint policy has been marked by this youthful enthusiasm and honesty of conviction. 32 years of leadership has established the fact that Hotpoint is forever aggressively abreast of the times with new and always better products; that its policies of fair dealing are simple and sincere; that the millions of dollars Hotpoint has invested in local and national advertising prove a belief in even greater opportunities awaiting us all.

People never are old so long as they can change with the changing times. Hotpoint is 32 years old in tradition, but forever young in ideas, ideals and a belief in opportunity. Three good reasons why Hotpoint is today "the name everybody knows."

Vice-President

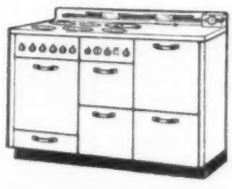
$99.95 F. O. B. Factory Chicago

INSTALLATION EXTRA

The NEW CENTURY Price Leader

Hotpoint High Quality At A Real Low Price

- 3 new improved Hi-Speed Calrod Surface Units, each with 5 Measured Heats.
- New Radiant Broiler Unit.
- New Indicating Switch Buttons.
- Oven Signal Light.
- 5-Heat Thrift Cooker with Flavor-Seal Lid.
- Oversize, All-Purpose, Flavor-Seal Oven.
- New Calrod Baking Unit with new Heat Deflector.
- All-Porcelain enamel inside and out.
- Automatic Oven Temperature Control.
- One Large Sliding Storage Drawer.
- Double Size Tilt-Out Bin.



ELECTRIC RANGES

REFRIGERATORS • WATER HEATERS • WASHERS AND IRONERS • CLOTHES DRYERS • AUTOMATIC DISHWASHERS • ELECTRASINK

TRADE MARK REG. U.S. PAT. OFF.

Nichrome

Made only by DRIVER-HARRIS COMPANY

Stocked for the Coast Trade at

SAN FRANCISCO
235-241 San Bruno Ave.

LOS ANGELES
449 South San Pedro St.

SEATTLE
2122 Fourth Ave.

By

ANGUS-CAMPBELL, INC.

THERE ARE "BESTS" IN EVERY INDUSTRY

IN ELECTRICAL APPLIANCES IT'S

Sunbeam

Automatic MIXMASTER
Double Automatic IRONMASTER
SILENT AUTOMATIC TOASTER
Automatic COFFEEMASTER
SHAVEMASTER
FLAT TOASTER • FAN HEATER
GLASS COFFEE MAKERS
WET-PROOF HEATING PAD
MASTER PLUG & CORD SET
WAFFLE BAKER

MADE AND GUARANTEED BY
CHICAGO FLEXIBLE SHAFT COMPANY
5600 West Roosevelt Road, Chicago, Illinois
316 Commercial Street, Los Angeles, Calif.
224 S. W. Temple Street, Salt Lake City, Utah
557 Market Street, San Francisco, Calif.
50 YEARS MAKING QUALITY PRODUCTS

HANDLE MORE JOBS

IDEAL NEW

No. 00 "Handy" FISH TAPE, REEL AND PULLER

- Prevents breakage.
- Reel gives sure grip, eliminating special pullers.
- Keeps Fish Tape under control.
- Reduces cost of fishing.
- Complete with 50 ft. of ⅛" x .045" tape.
- 3 Tools in One for only $1.50.

NEW IDEAL BX ARMOR CUTTER

- Cuts armor from 2 or 3-wire, No. 12 or No. 14 BX, in one operation.
- No more nicked insulation or shorts.
- No wasted BX.
- Just open jaws and snip!
- Pocket size. Inexpensive.

OTHER IDEAL TIME-SAVERS

IDEAL SOLD THROUGH JOBBERS
IDEAL COMMUTATOR DRESSER COMPANY
1042 Park Avenue Sycamore, Illinois
SALES OFFICES IN ALL PRINCIPAL CITIES

"WHAT CAN IT DO FOR ME?"

Advertising that is read with this thought in mind, may provide the solution to a problem that has kept you awake nights.

We all know "It Pays To Advertise." It pays just as big to investigate WHAT IS ADVERTISED—every month in

ELECTRICAL WEST

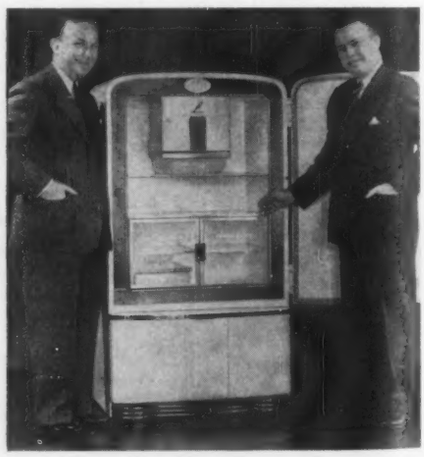
the switch is to turn current off completely. The time dial is set at a particular heat and automatically turns off at the desired time. On all 7 models the switch is placed on the back panel out of reach of small children. This range line is designed especially to make Vitamized cooking easy. Models range from the double oven Emperor at $322.00 down to the Champion at $149.95 and apartment model $106. The extra large oven delux Commander in the West lists at $199.95.

Westinghouse Laundries

Vibration-free operation is an important design improvement in the brand new Westinghouse Laundromat. Three giant steel springs and 5 heavy snubbers between the outer tub and the cabinet absorb all motor motion. All controls for temperature, time and washing cycle are assembled on the frame so that they are not affected by machine vibration. Carrying the clothes through the complete laundering cycle automatically, the Laundromat drains after each process, no dirt or grime can accumulate, and finally dries the clothes by spinning them in a porcelain basket 1500 times in 3 min., then shuts itself off. Using only ⅛ kw. hr. of current per complete washing, the Laundromat may be installed anywhere without being anchored to the floor and can be started or stopped by a right hand dial. Exterior cabinet is of white synthetic enamel and on the sloping front is a square door similar to that of an electric range.

Leonard Refrigerators

Leonard Refrigerators, too, in 1941 concentrate on five 6¾-cu. ft. cabinets and two 8¾-cu. ft. models with a price range that starts at $114.75 and ends with the Hi-Humid 8-ft. model at $209.95. The 6-ft. model that sells at $124.95 is $15 lower than the lowest priced equipped refrigerator offered last year. Leonard also has at the top of its line the humid-



Leonard refrigerator

ity chamber called its Hi-Humid system. With a glass shelf walling it off and 2 glass metal-trimmed doors, this humidity compartment keeps outside air from entering the humid area when the refrigerator door is opened. A second set of refrigerator coils in the walls and bottom of the cabinet serve this part of the refrigerator. Four other zones of cold are provided. A five-way Presto-shelf makes available room for tall and bulky objects. It makes use of the right-hand of the center and bottom shelves. With a flush door face and new type of door construction, several inches more of available space are provided in the food compartment. The line is de-

WOULD YOU BELIEVE IT ?

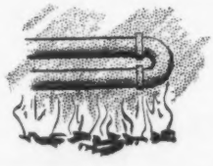
THINGS YOU MAY NOT KNOW

NO HEAT IS WASTED WITH THE HOTPOINT AUTOMATIC ELECTRIC WATER HEATER, FOR THE IMMERSION UNIT HEATS ONLY THE WATER—NOT THE OUTSIDE AIR

FIRST WHITE HOUSE BATH TUB WAS INSTALLED IN 1850 BY PRESIDENT MILLARD FILLMORE, AND IT SERVED THE OFFICIAL FAMILY FOR 35 YEARS

NO HOT WATER!

NEW YORK STATE QUIZ FOUND LACK OF ADEQUATE HOT WATER SERVICE FOURTH IN PEOPLE'S FAVORITE "PET PEEVES"



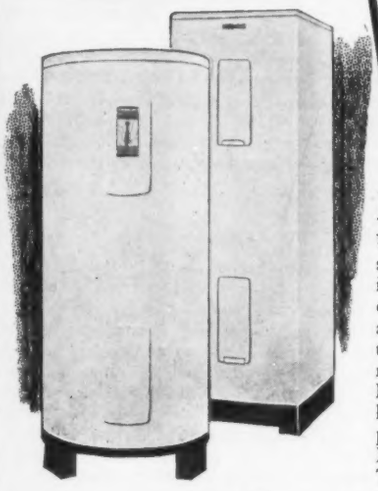
APPROXIMATELY 20% OF FURNACE FUEL SUPPLY IS USED TO HEAT WATER, TESTS SHOW. ELECTRIC WATER HEATING ELIMINATES THE WASTE OF FUEL

LEAKY HOT WATER TAPS OFTEN ARE DUE TO EXCESSIVELY HOT WATER GENERATED BY INEFFICIENT HOT WATER HEATING SYSTEMS. ELECTRIC HEATING KEEPS A CONSTANT TEMPERATURE OF 145° - 150°

IN THE AVERAGE AMERICAN HOME HOT WATER IS USED APPROXIMATELY EVERY TWENTY MINUTES EACH DAY, ACCORDING TO A SURVEY

ELECTRIC HEATING OF WATER IS SAFEST! NO MATCHES, FLAMES, DANGEROUS FUMES. IT'S "SAFE AS THE ELECTRIC LIGHT YOU READ BY"

NEW HOMES BY THE THOUSANDS - GIGANTIC BUILDING PROGRAM UNDER WAY NOW IN AMERICA MEANS THAT MANY HOMES RIGHT IN YOUR OWN LOCALITY ARE RIPE PROSPECTS FOR HOTPOINT WATER HEATERS



HOTPOINT offers Calrod, the famous efficient, durable and economical Immersion Unit which, immersed directly into water, assures far greater speed and economy in heating. A never-ending supply of hot water, day or night, is assured by the completely automatic Thermosnap Temperature Control. The new home and remodeling market is ripe for sales of Hotpoint Electric Water Heaters. Ask about Hotpoint sales promotion helps. Sell the best-known and most complete line in the Industry. Edison General Electric Appliance Company, Inc., 5612 W. Taylor Street, Chicago, Ill.

AUTOMATIC ELECTRIC **Hotpoint** WATER HEATERS

ELECTRIC RANGES · REFRIGERATORS · WASHERS AND IRONERS
CLOTHES DRYERS · AUTOMATIC DISHWASHERS · ELECTRASINK

Edison General Electric Appliance Company, Inc.
5612 West Taylor Street, Chicago, Illinois

Please send me full information on the complete line of Hotpoint Automatic Electric Water Heaters.

*Name*_____

*Address*_____

*City*_____ *State*_____

signed for step-up selling with definite features added to each step in the line to justify its additional price.

G-E Ranges

Outstanding new features of General Electric's 7 new ranges are the open-coil 5-heat thrift cooker replacing the 3-heat unit and having a higher "high" and lower "low" temperature; direct-flow no-stain vent of solid brass with leak-proof asbestos gasket; broiler pans having 30% greater area. New design in broiler units is the "spread broil" for larger food quantities and is 48% faster than previously, while "slow broil" for smaller food quantities is 25% faster. There are 4 oven switch positions—preheat 4000 watts; bake 2800 watts; broil and off. Also, the new 7-quart thrift cooker in the DeLuxe models employs a Calrod unit, the first all-Calrod range ever produced.

Price leader in the G-E range line is the "Leader" at $99.50; next is the "Master" at $129.95; the "Airliner," a fully automatic range at $149.95; and the "Studio" or apartment house range at $89.95. In the de luxe range are the "Chancellor" with thrift cooker and triple oven at $194.95; and the "Stratoliner" at $224.50 which includes the whistling "electrikettle" with 1150-watt Calrod base unit.

G-E Refrigerators

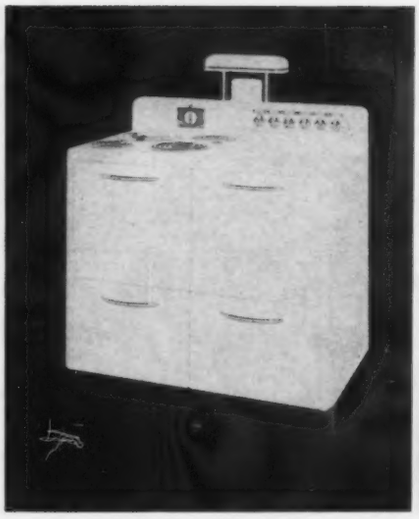
Wider, higher and larger than last year's top model, the new deluxe model B7 is the focal point in General Electric's 1941 line of 16 refrigerators. The butter conditioner and non-refrigerated storage bin are standard equipment, along with larger glass-topped fruit and vegetable drawers; the air filter has been relocated for more advantageous air flow; a new "steady cold" control maintains even temperature within, regardless of outside room temperature; and the new unit has 40% more refrigerating capacity than last year's deluxe model.

Included in this year's line are 4 "sixes" and 3 "eights," the latter providing a new set-up in capacity. For large families there are the porcelain finished models in 12- and 16-ft. sizes and for apartment house use primarily, the 2 "threes" and 2 "fours" are available. Outstanding in the small sizes is the B3, a new self-contained refrigerator standing 36 in. high and offering 6.7 sq. ft. of shelf area. Prices in the West are competitive with those of other makes in various classes.

Kelvinator Refrigerators

Six 6¾- and two 8¾-cu. ft. models make up the 1941 Kelvinator refrigerator line. One model in each size carries the new "Moist Master" system with refrigerating coils in the walls and 5 cold zones. The "Cold Mist fresheners" or super-moist zone is an all-glass compartment in which air circulation is retarded leaving no necessity for covering foods. Located above the latter is the moderate moist zone for foods requiring a moderate amount of moisture.

Price leader in the line is the 6¾-ft. model at $114.75, rust proofed inside and out, finished in improved Permalux, and equipped with a removable middle shelf. A vegetable bin for unrefrigerated storage, glass covered crisper and meat chest and the 5-way magic shelf are included in the $139.95 model. The deluxe-featured job at $154.95 has more shelf area and 2 crispers while the $159.95 model, with all basic equipment, has an all-porcelain cabinet, inside and out.



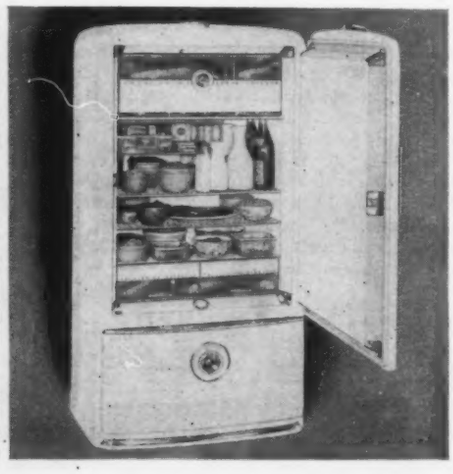
G-E range and refrigerator

Kelvinator refrigerator

Frigidaire Refrigerators

Seven of the 15 new Frigidaires have the Cold-Wall or moist refrigeration units and are styled in 3 different cabinet designs instead of one general design. Notable innovations are the completely finished back panel, a storage bin for canned goods and the Quickube trays with instant release features on all models. Continued improvement of the Meter-Miser refrigeration unit increases refrigeration capacity and quicker freezing service in every model. In the Cold-Wall Deluxe series, a chest-type freezer occupies the entire top of the food compartment, one side of which is used for ice cubes and frozen storage and the other for fresh meat storage. The freezer door is hinged from the bottom and let down to form a convenient shelf. There are no 5-cu. ft. models, nine 6.9-cu. ft. models, only one 8-cu. ft. and for the first time in 5 years there are two single-door cabinets of 9-cu. ft. capacity, one finished in dulux and the other in porcelain. Price range runs from the leader model at $119.75 west of the Rockies to a top deluxe 9-ft. porcelain model, $274.75, with step-up selling designed into the line.

Frigidaire range and refrigerator



Frigidaire Ranges

Tubular surface cooking units of stainless steel equip every range in the 9 new Frigidaire models. Increased speed of from 12 to 18 per cent provides the smaller units with a capacity of 1300 watts and in the larger units, 2100 watts. All 3 deluxe ranges have oven illumination and fluorescent lighting is offered in the B-70 and B-60 models. The BC model is a combination range offering both electric cooking features and coal and wood heating facilities. Several refinements in design of the Cook-Master have been made and the deep well cooker or Thermizer has the tubular heating unit with a top wattage of 600. Operation of the well cooker, in deluxe models, is controlled by a switch which turns to low automatically during any period up to 30 minutes. Price range is from $98.00 for the partment model to $249.75 for the top deluxe model.

Electric Range SALES BREAK ALL RECORDS . . . INDUSTRY ADVERTISING DOUBLED IN 1941!

MORE electric ranges sold than in any other year in history. That was 1940! The Modern Kitchen Bureau's electric range national advertising doubled! *That's* 1941! More electric range sales than *ever* . . . that's 1941, too!

Five leading women's and home service magazines carry the copy. Ads every month. Ads with a powerful, *proved* selling appeal. A total of 60,000,000 messages to electric cooking prospects . . . *your* prospects!

A *double-barrelled* promotion for Spring! RECORD-YEAR Spring showing PLUS Round-Up of He-Man Recipes! A life-size cut-out window display painted specially for MKB by James Montgomery Flagg! Flagg art to use in your own newspaper advertising! A recipe booklet that is one of the most unusual ever produced! A *twin* promotion that will build traffic and make sales!

1941 is your year of bigger opportunity. The Modern Kitchen Bureau offers you *more* sales helps and *more* national advertising. Plan now to *tie* in and *cash* in!

Ask your electric league, distributor, utility, or any of the manufacturers listed below. Or write to:

A special MKB collection of Famous Recipes by Famous Men put together in a traffic building booklet that every woman in town will want! James Montgomery Flagg, Victor McLaglen, Guy Kibbee, Hal Phyfe and many other famous He-Man cooks are there, each with his own favorite recipe! So *be there* yourself and cash in on this spectacular promotion that is backed by the *biggest* national advertising campaign on electric ranges in MKB history!

THE MODERN KITCHEN BUREAU, 420 Lexington Avenue, New York, N. Y.

ESTATE · FRIGIDAIRE · GENERAL ELECTRIC · GIBSON · GLOBE-AMERICAN · HOTPOINT · KELVINATOR · MONARCH · NORGE · STEWART-WARNER · UNIVERSAL · WESTINGHOUSE

WESTERN

Send the following message, subject to the terms on back hereof.

ELECTRIC APPLIANCE RETAILERS, U. S. A.

WITH CARLOAD ORDERS FROM RET
OF A YEAR AGO . . . THE SECOND
PROGRAM IS ALREADY A PROVED

What Kelvinator's long-range Program of Planned Distribution and Manufacturing means to the Retailer of Refrigerators and Ranges

THE long-range Kelvinator program, which this year enters its second period, according to schedule, could only have been created by a "retail-minded" organization.

That fact is at one and the same time Kelvinator's most valuable possession and the Kelvinator franchise holders' assurance of continuing and expanding profits.

One by one Kelvinator has faced the problems of refrigerator and range retailers—haphazard step-up pricing—too many retailers—high prices—complacent engineering and product planning—too many models. And, one by one, Kelvinator has sought solutions.

Fortunately for Kelvinator, this "attitude of Mind" is perhaps the one thing in business that cannot be copied.

It helps explain the fact that Kelvinator for nineteen forty-one is, any way you look at it—"the hot line—and the hot franchise".

which are hereby agreed to

AILERS MORE THAN DOUBLE THOSE STEP IN KELVINATOR'S LONG-RANGE SUCCESS . . .

Check These Kelvinator Franchise Advantages Against Any Other

1 EXCLUSIVE EXTRAS . . . No other refrigerator offers the exclusive new Magic Shelf—the Stainless Steel Cold-Ban—the Glass-enclosed Cold-mist Freshener cooled by coils within the walls of the refrigerator. And the 1941 Kelvinator Ranges offer new, exclusive features at the lowest prices in history.

2 STEP-UP PLAN . . . A *logical* step-up plan based on the actual retail *value* of each added feature. The *higher* priced models, in both refrigerators and ranges, are easy to sell.

3 NEW LOW PRICES . . . Last year Kelvinator's new price policy revolutionized the industry. This year, step number two in our long-range program reduces refrigerator and range prices even farther, and greater values have been built into every model in the line.

4 HIGH UNIT SALES . . . Last year the average of 80 per cent of all Kelvinator retailers' sales was $160—which we believe sets an industry record. With this year's amazing step-up plan Kelvinator retailers will again sell an overwhelmingly big per cent of higher-priced refrigerators and ranges.

5 SIZE . . . One of Kelvinator's most important *extras* is size. Six cubic foot refrigerators are now six and three-quarter cubic feet—and eights are eight and three-quarter cubic feet—thanks to Kelvinator's new cabinet construction. And all ranges have big, *over-size* ovens.

6 SELECTIVE MARKETS . . . Kelvinator's 1940 policies, carried forward into 1941, have earned for Kelvinator the reputation of putting into actual practice—"a market for every dealer—a dealer for every market".

7 FEWER MODELS . . . By concentrating on the models people really want, Kelvinator has reduced its refrigerator line to *eight* models—its range line to three—and thus reduced the retailer's investment to a minimum and simplified his selling problem.

8 SERVICE-FREE . . . The Polarsphere Sealed Unit has set a record for reliable performance. Of the hundreds of thousands of Kelvinator refrigerators sold last year, less than one-half of one per cent were returned to the factory for service.

9 REPLACEMENT SALES . . . The new and radically different 1941 Kelvinator Moist-Master with its glass shelves and Cold-mist Freshener, offers the most powerful replacement incentive in years. And every 1941 Kelvinator is a *brand new* model. Not one is a relabeled carry-over from 1940.

10 ADVERTISING AND PROMOTION . . . The biggest campaign in Kelvinator's history is already under way with four-color magazine advertising—key city newspaper and transcribed radio spot announcements—new style billboard posters and complete cooperative advertising materials. Selling and product literature is printed in *full-colors*.

11 STOCKING . . . Kelvinator's Redisco Plan for 1941 provides the most flexible and liberal method of stocking refrigerators and ranges you have ever been offered.

12 PLANNED DISTRIBUTION AND MANUFACTURING . . . A long-range program developed by a "retail-minded" organization to help retailers build an increasingly profitable business.

Kelvinator Division, NASH-KELVINATOR CORPORATION, *Detroit, Michigan*

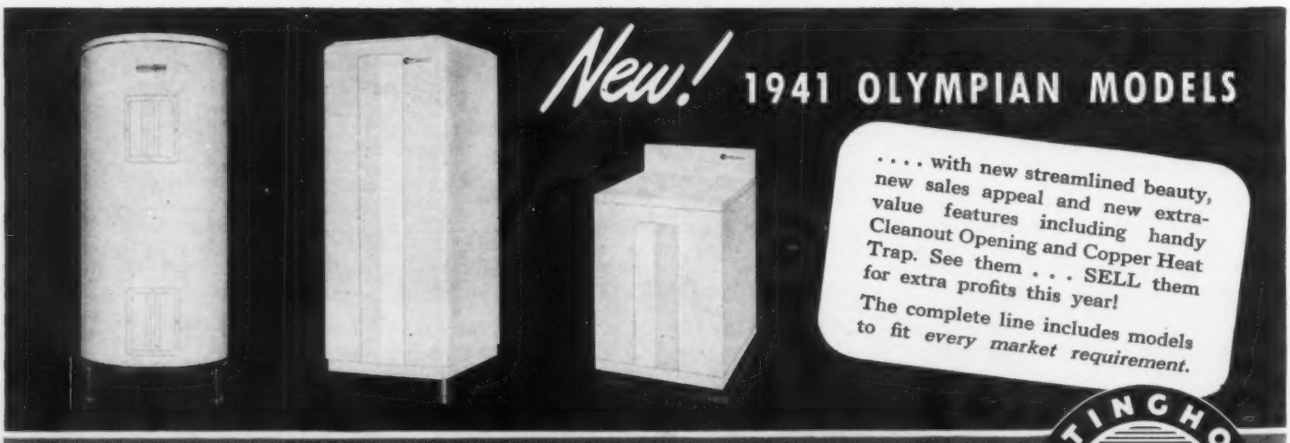
Get More—Get KELVINATOR

Dramatizes Inside Story of NEW Westinghouse *Electric* Water Heaters

"Prospects can't tell much about water heaters from the *outside*. What we want is a selling piece that will show the extra *inside* value of Westinghouse Water Heaters." That's what the nation's outstanding water heater retailers told us!

And the new X-RAY VISUALIZER does just that! X-ray windows in the big 16" x 24" pages enable you to virtually take the heater apart in front of prospects. You can *show* them, feature by feature, how Westinghouse gives them more value for the money!

Put this convincing and dramatic sales closer to work now winning *extra profits* for you with the NEW line of Westinghouse Water Heaters! Westinghouse Electric & Mfg. Co., Merchandising Division, Mansfield, Ohio.


New! 1941 OLYMPIAN MODELS
. . . . with new streamlined beauty, new sales appeal and new extra-value features including handy Cleanout Opening and Copper Heat Trap. See them . . . SELL them for extra profits this year!
The complete line includes models to fit *every market requirement.*

Westinghouse *Electric* Water Heaters

WESTINGHOUSE

FROM THE *Leisure Line* OF ELECTRIC HOME APPLIANCES

"SIZZLING" NEW WESTINGHOUSE RANGES FOR '41

PLUS— VITAMIZED COOKING ...A BRAND-NEW SELLING THEME

Styling, convenience features and value have been *stepped up* in the beautiful, new, 7-model Westinghouse Electric Range line to help you *"STEP IT UP IN '41."*

VITAMIZED COOKING . . . a brilliant, timely, new selling theme . . . adds new interest and selling power to your Westinghouse electric cooking story. It enables you to present essential fundamentals in a new light that prospects will understand and appreciate. It puts *your* story above the level of competitive claims and it sells on *merit* alone.

NEW SINGLE-SET SWITCH*

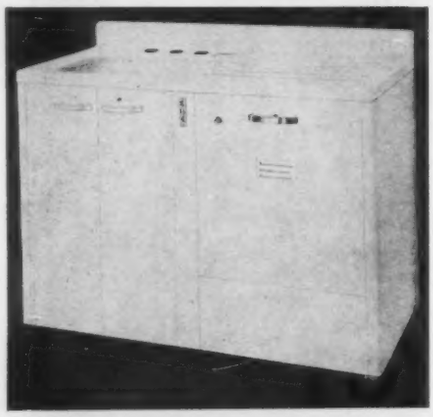
Just one of the outstanding, fast selling, Westinghouse Range convenience features for '41. Makes surface cooking completely automatic by reducing or shutting off current *automatically!*

*On Westinghouse Emperor, Regent and Commander Ranges.

Every house needs Westinghouse

STEP IT UP IN '41 with Westinghouse Electric Ranges! Get full details from your Westinghouse Range Distributor or write direct to Westinghouse Electric & Manufacturing Company, Department 1015, Mansfield, Ohio.

THE *Leisure Line* OF ELECTRIC HOME APPLIANCES



Hotpoint range, dish washer, and refrigerator

Hotpoint Water Heaters

Water heaters ranging from 1-gal. size, 2-gal. "plug-in" Voguette to the 140-gal. commercial size have been designed by Hotpoint for 1941. Monel and galvanized tank types, as well as single and double units, are available. Models of 18 gal. and over use the new low-density Calrod immersion unit. For small installations, Hotpoint presents the 5-gal. Master heater with single Calrod immersion unit, only 21¼ in. high, which can be installed in locations where space has formerly been a problem.

Hotpoint Sinks

Especially designed for the building trade are the 2 new Hotpoint dishwasher sinks. One is equipped with sink top of stain-resisting white porcelain enamel and is 48 in. wide, 39½ in. high and 25 in. deep. The other is a dishwasher-cabinet combination, without sink top, and is 48 in. wide, 34½ in. high and 23¾ in. deep. Both models have the two-rack electric dishwasher with front-opening door.

Hotpoint Refrigerators

A butter conditioner compartment, brilliant white Textolite door strips and additional storage space are preeminent features in the 15 new Hotpoint refrigerator models ranging from 3- to 16-cu. ft. capacity. Several DeLuxe and Imperial Models carry the new extra storage drawer, the butter conditioner, a large speed freezer and the air purifier mounted between the vegetable drawers of the Hi-Humidity storage compartment to prevent circulation of food odors. Humidity control on the meat storage pan is included in the 7-cu. ft. Standard as well as DeLuxe and Imperial models. Calgloss-finished speed freezer doors, glass water bottle, automatic interior lights and defrost indicators are standard equipment on nearly all models. Hotpoint offers 3 Special models of 3, 4, and 6 cu. ft capacity; 4 standards of 3, 6, 7, and 8 cu. ft. capacity; the DeLuxe series in 6, 7, and 8 cu. ft.; and the Imperial series in 6, 7, 8, 12, and 16 cu. ft. models.

Hotpoint Ranges

The All-Purpose Flavor-Seal oven, Calrod baking unit, Calrod-heated Thrift Cooker and built-in Timemaster are foremost features of the 8 new Hotpoint ranges announced for 1941. Four of these models have oven interior lights which light only when the door is opened wide. By consumer demand, all ranges are built-to-the-floor except the Bungalow model. Outstanding model is the DeLuxe Tiffany range having every new feature including the "warmer" unit and "Tiffany" utensil set which consists of 3 copper-clad, stainless steel covered utensils especially designed for waterless cooking.

Hotpoint Clothes Driers

A tumbler clothes drier which can be installed on any 110-volt house circuit, but which does not replace the tumbler clothes drier of 1940, is announced by Hotpoint Home Laundry Division. In this new model air is heated by a 1400-watt unit, no special wiring is required and the clothes are safe from weather, soot and dust—washday can be any day, regardless of weather.

Hotpoint Cabinets

Two full lines of modern steel kitchen cabinets in DeLuxe and Standard lines are announced by Hotpoint. The DeLuxe cabinets are of 22-gauge steel finished with 2 coats of synthetic enamel, each baked separately at 300 deg., and equipped with hardware chrome-plated on solid die cast metal to match that on Hotpoint ranges and refrigerators. Accessories to complement this line include soffit lights, cutting boards, cutlery trays, flour and sugar bins, condiment shelves, etc. In the Standard line, there are cabinets in all-drawer or all-cupboard types finished with one coat of synthetic enamel and equipped with chrome metal handles.

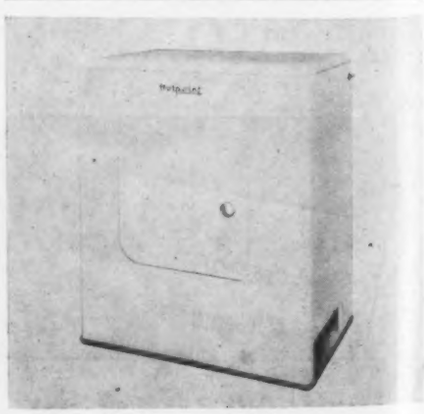
Hotpoint Washers

All four wringer washers in the new Hotpoint line are shiny white. Each employs the Thriftivator washer mechanism having only 4 moving parts. Three of these models with tub rim and cover streamlined, have the 1941 Thriftivator control employing automobile type gear shift—all Hotpoint washers are available with or without pumps. The top model is the handsome 24-gal. Puritan with full-length skirt and streamlined Lovell wringer finished with baked-on white Calgloss. Instant safety release, equalized pressure rolls, full end-lever reset and automatically tilting drain board are commanding features of the Lovell wringer. Two Spinner and four Wringer washers, the 2 Priscilla and Priscilla Imperial Ironers, the portable Priscillaette ironer and 2 Tumbler Dryers constitute Hotpoint's 1941 complete home laundry equipment.

Hotpoint Dishwashers

A drying operation assisted by an 800-watt Calrod heating unit mounted in an insulated hub is a unique development of the new Hotpoint fully automatic electric dishwashers. One push of a putton gives dishes the entire cleansing cycle from spray-wash-rinse to warm air drying. The Calrod unit begins to heat after the spray-wash-rinse cycle is completed and the impellor is allowed to operate and circulate warm air within the tub. After 20 minutes the impellor and Calrod unit are automatically shut off. One revolution of the timer cam makes and breaks contacts in the proper sequence to wash and dry one dishwasher load—even a second push of the button, once the cycle starts, will not interfere with proper completion of the operation. Two basic models make up the line—one free-standing and the other a dishwasher-sink combination, both with or without tops. The latter is convertible into a Hotpoint Automatic Electra-sink through addition of a Hotpoint Kitchen Waste Exit.

Hotpoint washer, and tumbler dryer



The "LEADERSHIP LINE" for '41!

The Finest General Electric Ranges Ever Built!

The Stratoliner
Model DD2-41

Every Roast will work for you in 1941!

G-E "ROAST OF THE MONTH" CLUB

will bring customers into your store!

Get details from your G-E Distributor!

Styled for LEADERSHIP in 1941!

Chancellor
Model DD1-41

Airliner
Model CD3-41

Master
Model CD2-41

Leader
Model CT1-41

Now You Can Sell the G-E "LEADERSHIP LINE" at Lowest Prices in G-E History!

Now, for 1941, G.E. gives you a line of electric ranges that hits a new high in performance and a new low in price. See this new line, and your eyes will pop at new beauty, new sales features, new customer appeal.

And remember—this finer range will be backed by bigger promotion than ever—in national advertising, mailing pieces, color displays, ads for local papers—everything you need to cook a juicy profit on G-E Ranges.

The trend is to electric cooking. Figures prove this fact. And in 1940 the rate of increase in the sale of G-E Ranges was twice as great as the entire industry.

Swing ahead with the G-E "Leadership Line" for 1941. Get your G-E distributor's story of a proposition that's a honey!

G-E "Roast of the Month" Club a Real Builder of Sales!

Here's a promotion that actually delivers prospects at your point of sale. Every woman will want to win a free G-E Electric Kitchen or a free G-E Range. She'll come into your store to get the entry blank. Tie up with this promotion and clean up with G-E Ranges.

GENERAL ELECTRIC

FOR WIRING ALL TYPES OF BUILDINGS

ADEQUATE WIRING SERVES AND SAVES

G-E HOME WIRING
provides completely adequate wiring for residences. Write for a bulletin.

Use

G-E HIGH QUALITY WIRING MATERIALS

You'll find exactly the wiring materials you want in the G-E line for wiring any sort of building. The line is complete. G-E wiring materials are made to be used together and are designed for easy installation.

G-E conduit is easy to bend, threads are accurate, interior finishes are smooth. G-E BX and BraidX can be stripped quickly. G-E building wire is clean stripping and easy pulling. G-E wiring devices have large binding screws, wide mounting ears, etc.

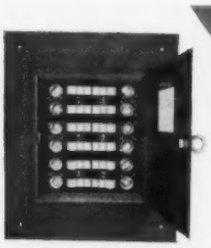
G-E wiring materials are made from the finest raw materials obtainable. Your customers will be pleased with long, trouble-free service they give.

For further information see the nearest G-E Merchandise Distributor or write to Section CDW-1182, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn.

GENERAL ELECTRIC

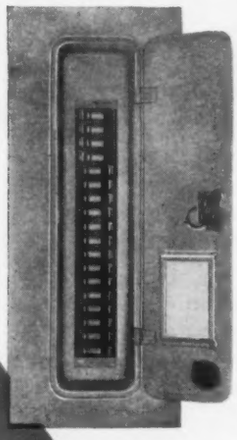
RIGHT ON YOUR HOME GROUNDS

Complete Bull Dog Service

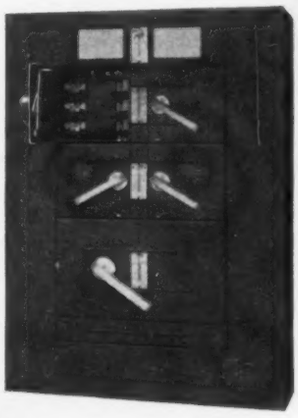


Rocker Type Lighting Panels from 4 to 40 circuits. Fusible.

Service Equipment with Range and Lighting Circuits. Surface type.



Circuit Master Circuit Breaker Panel and Cabinet.



Compact Switchboards using Vacu-Break Switch Units.

● You don't have to wait when you want Bull Dog products. Three west coast assembler representatives — in Portland, San Francisco and Los Angeles — give you immediate service on the complete Bull Dog line.

Bull Dog Standard Products — Service Equipment, Safety Switches, Panelboards, Circuit Master Panels and Switchboards — offer you a variety of time-tested products suitable for every type of domestic, commercial and industrial installation, from the smallest to the largest.

Bull Dog flexible light and power systems — BUStribution DUCT for power, Universal Trol-E-Duct for light, and Industrial Trol-E-Duct for portable tools or moving "loads" — enable you to tap right in for light and power *wherever and whenever needed.*

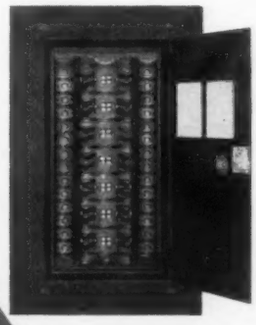
Write for descriptive illustrated bulletins on Bull Dog products with complete information on how they help speed up production and lower costs.

COAST ELECTRIC & MANUFACTURING CO.
1720 N. E. Sixth Ave.
PORTLAND, OREGON

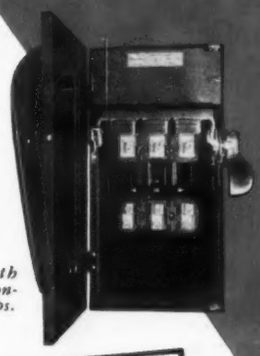
SAFETY SWITCHBOARD & MANUFACTURING CO.
528 Folsom Street
SAN FRANCISCO, CALIF.

MULLENBACH ELECTRICAL MANUFACTURING CO.
1025 E. 16th Street
LOS ANGELES, CALIF.

Direct your inquiries to these Pacific Coast assembler representatives.



Superba Panelboards —a Superb Engineering and Artistic Achievement.

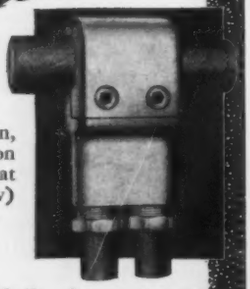


Safety Switches with Vacu-Break Arc Control. 30 to 1200 amps.

BULL DOG
ELECTRIC PRODUCTS CO.
DETROIT, MICHIGAN
Bull Dog Electric Products of Canada, Ltd., Toronto, Ontario

MANUFACTURERS OF Vacu-Break Safety Switches, Circuit Master and SafToFuse Panelboards, Switchboards, Duct Systems — FOR LIGHT AND POWER

The MOST COMPLETE
LINE OF
Tee Connectors



ALL good types —any size.

With a *hinged clamp* for the main, the Penn-Union Type HFM (at right, and below) is easy to apply.

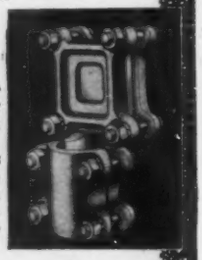
Split sleeve contact unit gives permanent grip on branch.

Made for single or multiple branch connections.

ALSO CABLE TAPS — a complete line of 90° and Parallel taps, for one or more branches,

COMPACT and POSITIVE. The Penn-Union Type SM gives equal tightening on the run and tap. Self-locking, dependable.

CLAMP TYPE TEES for all sizes of tubing and cable—a full line. Machined contact surfaces.



MANY MORE TYPES—for all combinations. For connecting flat bar, run or tap, to tubing or cable. Also "general utility" tees that take a wide range of conductor sizes. You will find that the Penn-Union line has *exactly what you need.*

FOR ANY CONDUCTOR FITTING—Terminals, Service Connectors, Studs, Two-Ways, Ground Clamps—see the THOUSANDS in the Penn-Union Catalog.

Preferred by the largest users, who have found that *Penn-Union on a fitting is the best guarantee of Dependability.*

NICHOLAS & COOK
1063 HOWARD STREET
SAN FRANCISCO

NORTHWESTERN AGENIES
2411 FIRST AVE.,
SEATTLE, WASHINGTON
PENN-UNION ELECTRIC CORP., Erie, Pa.

PENN-UNION
Conductor Fittings

Norge Refrigerators

The "Night Watch" fully automatic defroster is the distinctive attribute of the Norge 1941 refrigerator line. Standard on 4 models, the "Night Watch" automatically turns off the Rollator cold-maker every night at midnight long enough to melt the day's frost accumulation which drains into the Handefroster, a compact out-of-the-way glass container that needs emptying only once a week. Thus the Coldpack meat drawer is never used as a defrosting tray and the Night-Watch also serves as an electric kitchen clock, self-starting and

Norge refrigerator

permanently lubricated. Most models have the sliding Hydrovoir humid drawer for vegetables, the unrefrigerated storage compartment, and flexible shelf arrangement which can be quickly adapted to many storage purposes. A new 9 ft. model is designed for farm homes. Price range is comparable to that of the major lines.

Gibson Refrigerators

In addition to the Super-Freezer Shelf, Gibson Electric Refrigerator Corp. offers an additional attraction in its new line of refrigerators by providing the chill-drawer which moist-chills at near freezing temperatures and is useful for salads, meats, etc. Adjustable twin vegetable fresheners, Defrostajar and the Tilt-bin for non-refrigerated storage for packaged and bottled foods, canned food and pots and pans are additional improvements to 1941 models. Suggested list prices range from the conventional type at $89.95 to the Super Freez'r Shelf models at $219.95.

Gibson Ranges

Having initiated a cooker well with 5 speeds and 10-qt. capacity, the Gibson range this year will play up this initial advantage as well as a number of refinements in design. Its Kookall is equipped with 1500-watt element in an insulated well and is on thermostatic control. Steam cooking is also a possibility with this well. Ovens are 16x16x20 in. and surface units can be either Chromalox or TK. All surface elements have 5 heats and the oven two elements. Accessories include lamp, timer, condiment set and sizzling platter. Controls are on the back panel set at an angle for ease of reading. Price range is from $99.95 to $229.95 f.o.b. factory.

Crosley refrigerator

Crosley Refrigerators

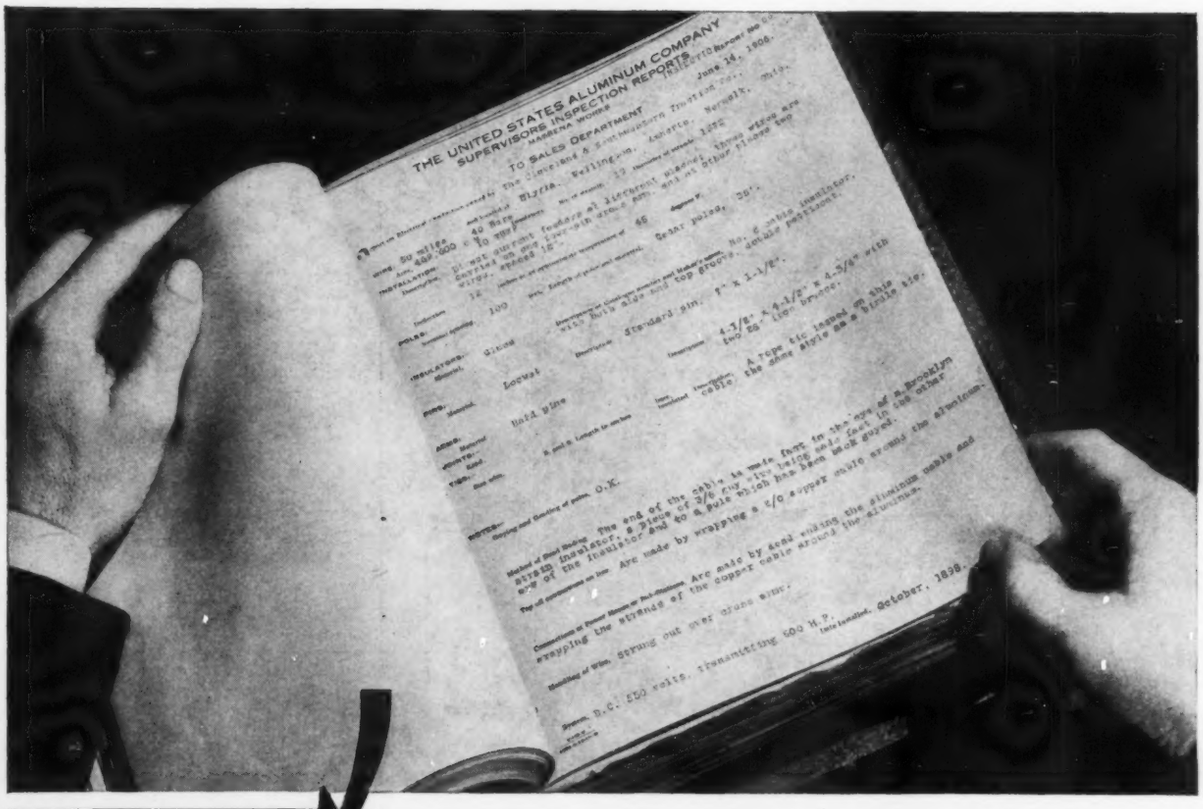
The new Super Shelvador with 5 extra shelves in the door sets the Crosley refrigerator line apart from all others. The removable lower shelf which makes room for bulky storage, the Freezorcold ice compartment with quick-release ice trays, automatic flood light, and porcelain food compartment are standard equipment on most models. The deluxe "8" model has the added conveniences of the Storabin for non-refrigerated storage and the Moist-Kold compartment with individual cooling unit giving high humidity and air circulation for uncovered storage of fresh vegetables, salads, etc. All models have all-steel cabinets and are equipped with the super-powered Electrosaver unit hermetically sealed. Door shelves are of sheet metal rather than wire this year, with removable bottoms to make cleaning easy. Crosley prices start at $114.95 and run to $229.95 for the Moistcold 8 in the West

Stewart-Warner refrigerator

Stewart-Warner Refrigerators

Fifty pounds of food or 480 ice cubes may be frozen in the Dual-Temp freezing locker of Stewart Warner's new deluxe refrigerator model. This freezer keeps food fresh with moist cold and keeps frozen foods fresh for months. Added developments in Dual-Temp are the sterilamp to kill bacteria, dry storage cabinet and sliding vegetable basket with glass cover. Standard model prices range from $101.95 up to $159.95 in four different models deluxe Dual-Temps from $189.95 to $259.95.

"I *helped make* Conductor History



DEFENSE COMES FIRST

To meet the needs of the National Defense Program, plus the normal demands of peace, a vast expansion of our already greatly increased production capacity is being speeded. When the emergency is past, there will be more Aluminum available than ever before.

Meanwhile, if you can't get all the Aluminum you want when you want it, remember Aluminum is helping you by helping to meet the National emergency. Aluminum Company of America, 2132 Gulf Bldg., Pittsburgh, Pa.

From the earliest days of Aluminum power lines, our engineers have been "in the field;" assisting designers and builders, studying the performance of finished lines. Observations were recorded in books like this.

Vitally important to industry was this study of the performance of these first Aluminum lines. Refinements responsible for the great dependability of present-day power lines were based on such on-the-job records.

A.C.S.R. evolved as the use of longer spans required higher strength conductors. Suitable accessories and construction methods have been developed and proved, even including a perfected system of vibration control.

ALCOA ALUMINUM

Reg. U. S. Pat. Off.

A·C·S·R

Aluminum Cable Steel Reinforced

FOR HIGH VOLTAGE TRANSMISSION and RURAL POWER LINES

THE LIGHTING EQUIPMENT

Profit-Book

OF THE YEAR - IS HERE!

And it's YOURS
For the asking!

New
PERMAFLECTOR LIGHTING CATALOG
NO. 40

● Your copy of the lighting equipment "extra" for "extra lighting profits" is just off the press. Send for it now!

● You'll be mighty glad to have a copy of the new Permaflector Lighting Catalog No. 40 because it gives you the answers to your lighting problems—quick as a wink! Every page is chock-full of useful lighting data and presents important information on new Permaflector sales-building lighting equipment simply, concisely and completely in a new, different way—designed for quick, accurate selection and ordering.

● No groping for information in this catalog—it's all at your finger tips. An important factor in these days of working against time for National Defense.

Send for your copy today.

New PERMAFLECTORS

New PERMAFLECTOR HIGH BAY INDUSTRIAL UNITS

New PERMAFLECTOR LUMINAIRES

New PERMAFLECTOR EXTERIOR FLOODLIGHTS

New PERMAFLECTOR FLUORESCENT EQUIPMENT

Pittsburgh Permaflector

PITTSBURGH REFLECTOR COMPANY EW-2-41
Oliver Building, Pittsburgh, Pa.

Please rush my copy of the New Permaflector Lighting Catalog No. 40.

NAME .....

STREET .....

CITY..... STATE.....

PITTSBURGH REFLECTOR CO.
403 OLIVER BUILDING
PITTSBURGH, PENNA.

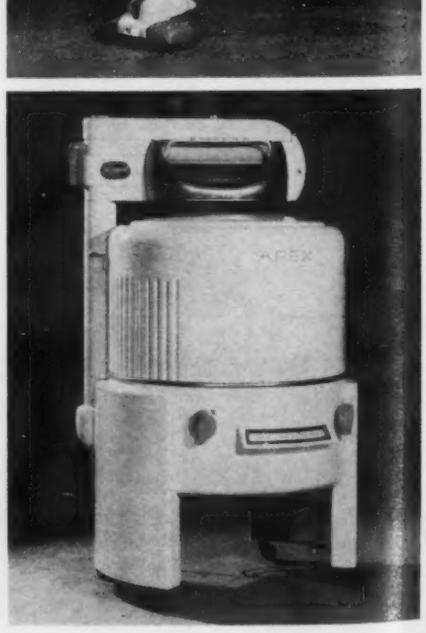
Apex Vacuum Cleaners

Functional design is stressed by Apex-Rotorex Corp. on the new Apex Speed Maid Cleaners put out in striking 2-color combinations. A starting and stopping switch is reached by the thumb without changing hand positions and a toe-tap speed selector button controls the 2-speed, rubber-mounted motor. Also, a finger tip control raises or lowers the handle with a minimum of effort, and the nozzle is self-adjusted. When bristles become worn, the entire brush need not necessarily be replaced for the bristles themselves are easily replaceable.

Apex Washers

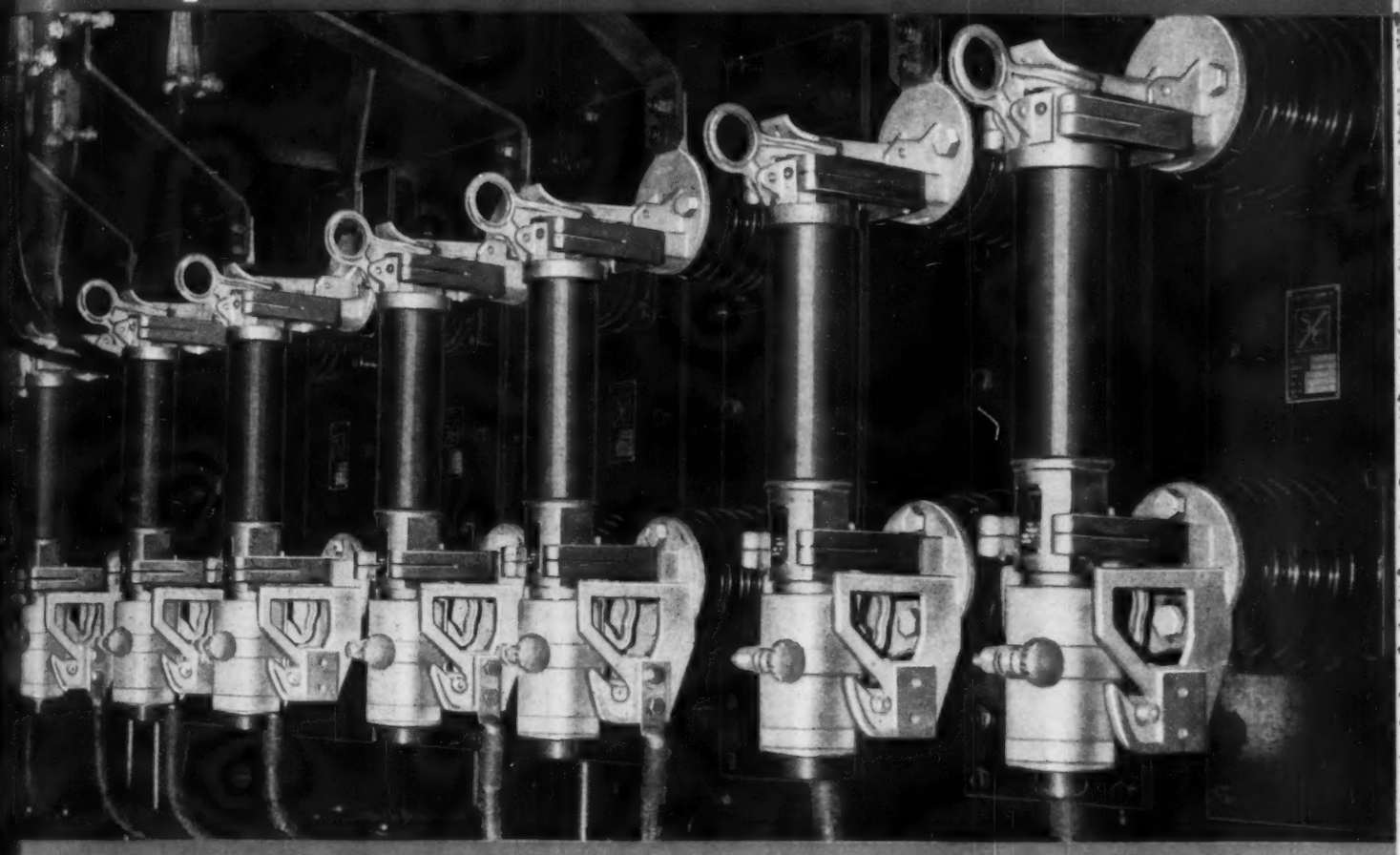
The Apex Time-Control which time washes automatically is the leading design innovation in the 1941 line of Apex washers. This mechanism throws the agitator out of gear automatically without stopping the motor, allowing continuous wringing operation. The new Apex is equipped with the Apex-Lovell wringer having interlocked safety control, roll top, balloon rolls, chrome feed pan and features the free-running gear mechanism, all parts of which run at low speed. The chassis is finished in high-baked enamel on bonderized steel.

Apex vacuum cleaner and washer



PRINT IN BINDING

A Dependable Defense at Lower Cost



Typical indoor substation protection—S & C Type "SM" Fuses protecting station light and power transformers and street lighting regulators.

Experience Will Choose the S&C Fuse

Within their range S & C Type "SM" Fuses will provide dependable, accurate short circuit protection at a cost much lower than other types of protective equipment.

Load ratings up to 10,000 KVA and short circuit energies up to 1,000,000 KVA can be handled by these S & C Power Fuses.

Designed and constructed up to S & C high standards—serviced on the job with standard S & C Re-Fill Units—they can be depended on to provide the protection your system deserves and at relatively low initial and maintenance costs.

Bulletin 200-E includes all data and rating information

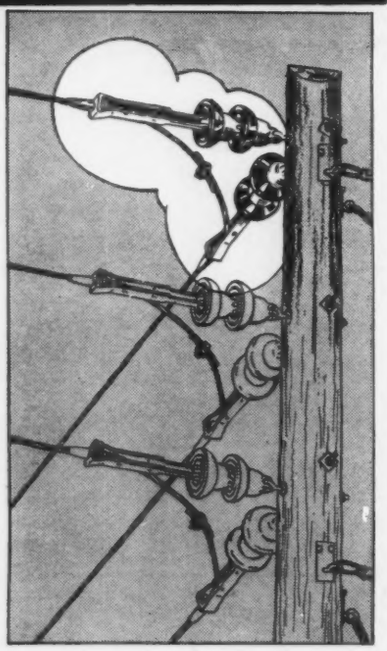
SCHWEITZER & CONRAD, INC.
4435 RAVENSWOOD AVE. • CHICAGO, ILL.

Replaceable Re-Fill Units

Re-fill Fuse Units are *replaceable* in SM Fuses *on the job.* Arc interruption takes place in the tube of this unit which is lined with a solid arc-extinguishing material.

TYPE "SM" FUSES

modernize
YOUR
DISTRIBUTION
PRACTICE—



RELIABLE
STRAIGHTLINE
DEADENDS

Reliable Straight-line Deadends with extra long rigid clevises offer plenty of clearance from skirts of large disc insulators on turns. An extra hole in the clevis accommodates a pin and sling to permit easy and accurate sagging of line.

Reliable
ELECTRIC COMPANY
OVER 25 YEARS SERVICE TO THE UTILITIES

BULLETINS

data books, etc.

Feeds for Moving Load—201

"Mobile Electricity" is the title of a new Bulldog catalog dealing with methods of feeding portable electric tools, cranes, hoists, etc. Sections such as "Guide for Job Analysis" and "Layout Symbols" will prove useful to plant men.

Voltage Regulator—202

A new dry type air-cooled regulator for feeder voltage regulation is well described in a 2-color 12-page bulletin by Allis Chalmers. It gives a well-illustrated description of how this regulator operates.

Industrial Refrigeration—203

Centrifugal refrigeration is the subject covered in an elaborate 42-page magazine-size bulletin issued by Carrier Corp. Equipment is described in detail, and there is a chapter on operations followed by material on operating costs and industrial application.

Wire Calculator—204

A 4-color slide rule type calculator based on the 1940 National Electrical Code has been assembled by Bull Dog Electric Products Co. One side is devoted to wire sizes, capacities, conduit data for code, performance, and heat resistant grades of wire. The other side shows data for wiring motor circuits. Distributed gratis to installers of electrical material, the nature of whose work requires frequent reference to the Code.

Metal Enclosures—205

FH Cubicles are covered in General Electric bulletin GEA-2499. This is a 20-page affair with many illustrations and diagrams.

Radio Interference—206

Practical engineering information with reference to eliminating sources of radio interference on various parts of the utility system are presented in a bulletin issued by Radio Interference Specialty Co. Among subjects given special attention are single-phase tap lines, tie wires, metal guy thimbles, pin type insulators, high voltage bushings and rural service.

Portable Cables——207

More and more is the appeal of trade literature being directed toward those working with defense industries. An example is G-E's 8-page bulletin (GEA-1918B) covering Tellurium portable cables.

Motor Maintenance—208

Described as giving a new answer to the same old question, General Electric's bulletin, "How to Maintain D.C. Motors", presents 8 pages of helpful tips and a trouble correction chart.

Fuses, Cutouts—209

Just off the press is W. N. Matthews Corp.'s bulletin No. 102 describing the various improvements and additions to the complete line of open type fuse switches and cutouts.

Connectors—210

Running to 80 pages, Catalog J sets forth complete details on Sheldon electrical connectors.

Radiant Heat Lamps—211

Radiant heat lamps for drying, baking and heating are covered in a new 12-page Westinghouse catalog. Several pages of application pictures are shown and 4 page-discussion of various technical considerations follow.

Fluorescent Units—212

The catalog listing the full line of Wiremold wired and unwired single, double and triple units for fluorescent lamps of 18 in. to 48 in., with or without reflectors, together with wired and unwired lamps for fluorescent lighting installations where continuous single or parallel runs are specified are set forth in a new Wiremold publication, together with prices equipped.

Portable Tools—213

A 60-page catalog on portable electric tools, 132 of them, has been issued by Black & Decker.

Power-House Motors—214

Motors for driving power house auxiliaries are set forth in Allis-Chalmers illustrated catalog B-6107. Details on various types of motors, many illustrations, a motor selection chart.

Transformers—215

Uptegraff has issued a 2-colored illustrated 16-page bulletin on power transformers.

All About Insulators—216

"Insulator Catalog No. 24" by Ohio Brass Co. runs to 160 pages listing all O-B materials for transmission lines, distribution lines and substations. Covered are all types of insulators, clamps, fittings, bushings, porcelain condensers, control gaps, etc. It includes a great deal of information on characteristics, and tables of recommended strain and suspension clamps for all commonly used conductors. A pictorial section shows manufacturing methods.

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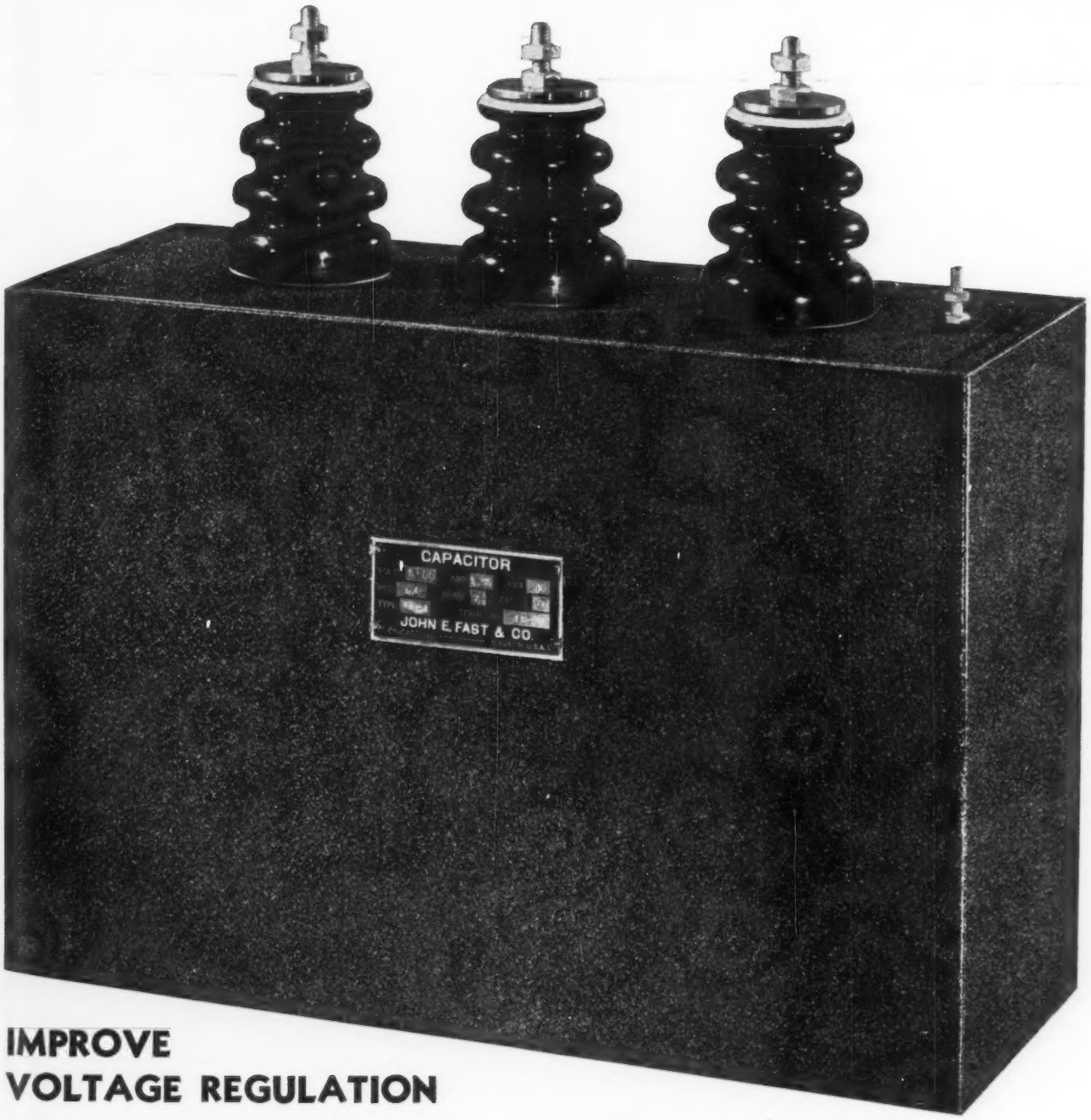

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Every Wagner transformer incorporates features and improvements that have been developed through almost fifty years of transformer manufacturing experience.

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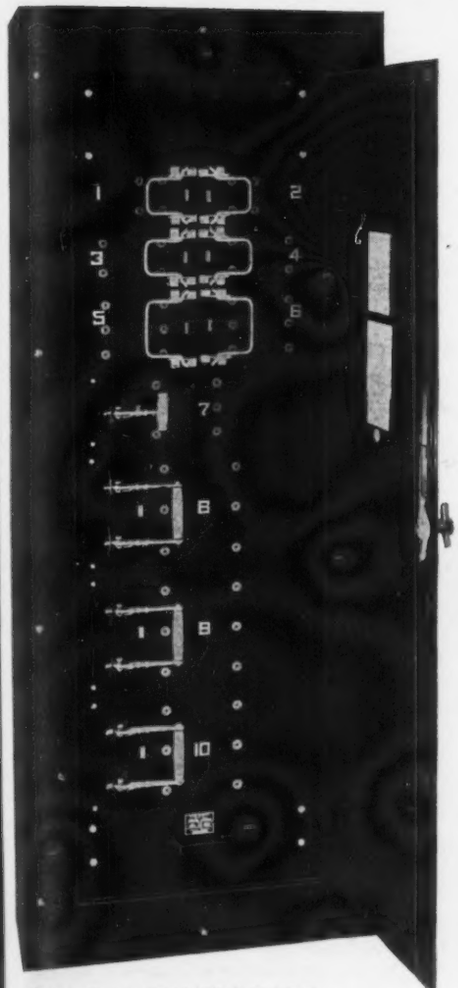


FUSIBLE PANELBOARD

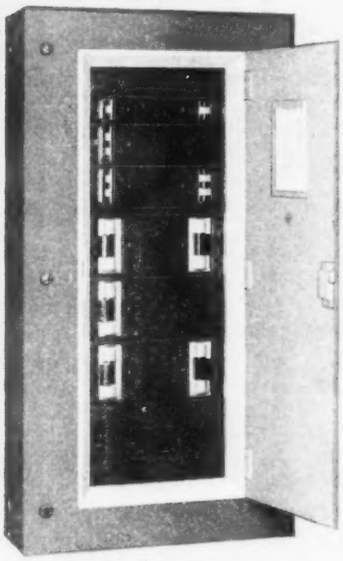
Illustrated above is a standard fusible distribution panel for power and light.

COST OF 230-VOLT CIRCUIT BREAKER PROTECTION REDUCED SUBSTANTIALLY!

For a long time, plant engineers have appreciated the advantages of circuit breakers over fusible panels for the protection of power and lighting circuits. But—high cost has prevented many circuit breaker installations.

That price barrier has been removed! For 115 or 230 volt circuits, Square D now offers the new type MH Multi-breakeR Distribution Panelboards at drastically reduced costs. Prices are now comparable with fusible equipment.

But that isn't all. Space requirements have been reduced—tremendously. Contrast the size of the two panels illustrated—each does the same job. Even on new installations, space is usually an important factor. On rewiring jobs, the use of MH panelboard interiors in existing panel boxes will provide the additional circuits made possible by the use of the new thin wall wire.



NEW MH PANELBOARD

These two panels do the same job. Illustrations show comparable size. The MH takes just about half the space.

Breakers are furnished in 15 to 100 ampere capacities . . . 2 or 3 pole, for 115 or 230 volt, single phase and 3-phase A.C. systems. Since these breakers are common trip (an overload on any pole will cause all poles to trip), they are suitable for use in ungrounded and polyphase systems and cannot cause the single phasing of a polyphase circuit.

The panels are completely dead front—no live parts are exposed even when restoring service after an overload or short circuit. The simple rugged construction of the breaker units assures the same long life and trouble-free service which have made Square D Multi-breakeRs so outstanding.

For complete information, write for Bulletin 5200. See how little it costs to provide modern circuit breaker protection.

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IN CANADA: SQUARE D COMPANY CANADA LIMITED, TORONTO, ONTARIO

ELECTRA'S HUSBAND

Who Sets the Price?

ELECTRA and our guest had spent the entire day at one of the many showings of 1941 appliances staged by distributors for their dealers. He was head of the appliance department of a large upstate home furnishing goods store. He had suggested that Electra might like to take in the show with him and she had jumped at the chance. The experience was new for her, and the color, drama, suspense and artistry with which the new appliances had been introduced had her surcharged with enthusiasm. To her mind the new low prices, the quality, the added conveniences and, finally, the new gadgets should be enough to make every woman in the West an immediate prospect for one or more of the things she had seen.

"Honey, we're going to build a new house," she suddenly announced, breaking into our casual conversation on the immediate business outlook.

"A new nothing," I said laughingly. "What's the matter with this place? And what ever put that idea into your head?"

"I was just thinking of what a grand kitchen I could have," she answered. "Bill there will bear me out. A sink that takes care of the garbage. An automatic dishwasher that you stack the dirty dishes in, turn on the switch and forget. And you wouldn't need a separate laundry room any more with all the improvements made in laundry equipment. In one side the kitchen I'd put an automatic washer and electric dryer along with a new ironer. The new refrigerators do everything but butter your bread and the ranges are going to give the gas salesmen the creeps, they're so grand. To make it complete, I'd install the wonderful metal cabinets that they make today. What a joy a kitchen like that would be! And at the low prices the manufacturers have put on the appliances, it wouldn't cost so very much either. About the price of a new car wouldn't you say Bill?"

"Yes, if you were going to buy a Buick," our guest answered. "But let me say something about the new appliances. Speaking strictly as a merchandiser, I'd say that the trade really could go to town if some of the new numbers had a real price appeal.

"Remember that newly designed washer," he said turning to Electra, "now if that was priced at $49.95 instead of $55.50, we could feature it. And if that 7-BYT refrigerator only had $10 knocked off its list along with the same kind of a deal on the model 41-K3 range, we could go into the newspapers and bring people into the store in droves. That kind of a price appeal would sell the stuff."

"But wait a minute, Bill," I interjected. "I thought both you and Electra said that the prices on the new models were the lowest ever quoted."

"We've got to have prices that will sell the merchandise," Bill said. "And we must have margins that will let us make a profit. It's up to the manufacturers to give us both. After all we are dealing with the public. We know what people will and won't buy and the prices that will induce them to purchase."

"Maybe you're right," I said. "But Bill, let me ask you a few questions. Where do you buy your clothes?"

"At Blanks's," he answered, naming a well known custom tailor whose prices range from $85 to $125. "What made you ask?"

"You'll find out soon enough," I replied. "That's a tailor here in the Big City exclusively, unless just recently he has opened branches in communities such as yours. Now if your merchandising philosophy regarding electrical appliances is sound, you're making a big mistake. You ought to buy your clothes from Bond's. They are the big clothing advertisers around here and they specialize on price. Why do you buy from Blank instead of from them?"

"That's a long story," Bill answered. "He's never gypped me. He carries patterns that I like. My clothes always fit. They wear well. If he makes a mistake, he corrects it. I've done business there ever since I could afford to have my clothes tailor made."

Up to now Electra had been a good listener, but she must have sensed the pitfall toward which Bill was heading. Womenlike she rushed in to do a little digging on her own.

"What happened the last time you bought a suit, Bill?" she asked with a devilish gleam in her eye as she glanced at me.

"Why just before the holidays I went in to get a new dark suit," he replied. "Before I left the place I had bought two suits and almost had a third. Blank told me that undoubtedly prices would go up. The supplies of good imported woolens were getting smaller and no one knew when there might be any new. I wanted a Harriss tweed for Spring and he had some material I liked. He almost sold me another. Only the thought of Christmas bills stopped me I guess."

"Did you say he almost *sold* you?" Electra inquired.

"Yes, almost sold me."

"He didn't offer to make two pair of pants?"

"No."

"Did he throw in a raincoat or a new hat?"

"Not even a pair of suspenders."

"How about a price reduction because you bought two?"

"Never from Blank."

"Wouldn't he give you a trade-in allowance on the suit you were wearing?"

"Don't be silly," Bill said.

"I was never more serious," Electra contended. "I just wanted to know. You went to buy one suit and you were sold two—no premiums, no price cuts, no big advertising splurge, no allowances. Nothing but some good reasons as to why you should buy now."

"Listen you vixen," Bill muttered as he suddenly realized where the discussion had led to, "there is a lot of difference between clothes and appliances. Besides I'm no ordinary individual. The same kind of appeals that make me buy wouldn't even raise the pulse beat of an average person, particularly a shopping housewife."

"Do you mean that a woman wouldn't recognize a bargain when she saw one?" Electra argued. "You go back to your store and tell them that the new appliances are miracles of research and production technique, particularly when their quality is compared with their price. Tell them that with the rush of the defense program, it's questionable whether these prices can be kept down. Show them how the new models will relieve them of work and worry. Then see what happens."

"Wait a minute," I interjected, sensing that the two might argue until someone's feelings were hurt. "How about that new kitchen?"

"You had better start worrying about how to pay for it. I'm sold."

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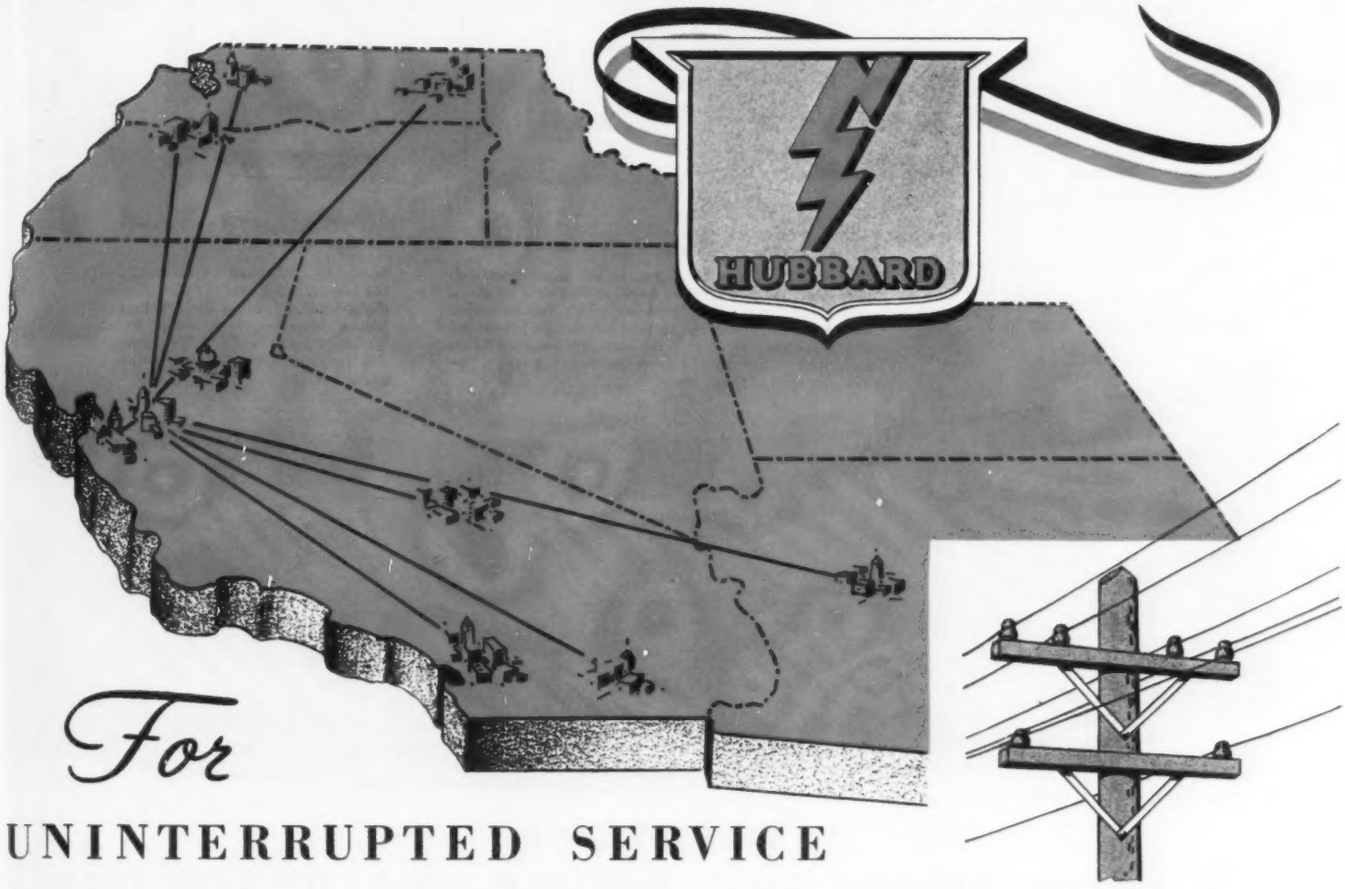

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COLD-WALL VALUES UP —PRICES DOWN AS MUCH AS $53!

Four out of five Dealer sales of 1940 Frigidaires averaged more than $162.00! And now, with prices of big Cold-Wall 6's starting at only $167.75*—with brilliant new exteriors and feature-packed interiors—we think you'll agree that Cold-Wall sales will easily double in 1941!

More than 100,000 Cold-Walls were sold in 1940! Watch this figure soar in 1941!

All Cold-Wall models have this new streamlined exterior

Model CD-6, illustrated above, is the most beautiful, most useful refrigerator ever made, giving new meaning to the word "De Luxe"! New full-width Super-Freezer Chest includes extra-large section for frozen foods and making ice and desserts. Scientifically designed Meat Tender compartment. Door becomes convenient drop-leaf shelf. Only **$204.75***

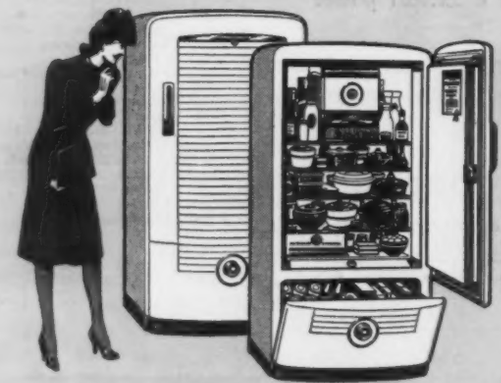
Model C-6, illustrated above, sells at the lowest price ever for a Frigidaire Cold-Wall. Features include larger frozen storage space, new Meat Tender, Super-Moist Hydrator—6.8 cu. ft. Food Compartment. Only **$167.75***

Brilliantly New Inside and Out!

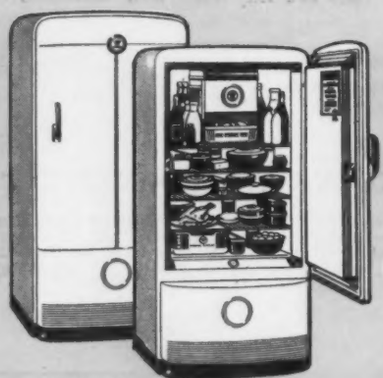
Just Imagine!

3 FULLY-FITTED FRIGIDAIRES—ALL UNDER $150

Every one with *Sliding Hydrators, Quickube Trays* and other outstanding Frigidaire Features



FULLY-FITTED M-6—Biggest "Six" in Frigidaire history! Actually has 6.9 cubic foot capacity and 14.2 square feet of shelf space. Fully-fitted including new-style Utility Compartment, Sliding Glass-Topped Hydrator and with entirely new Fluted Front Design. A great new value at . . . **$142.75***



FULLY-FITTED L-6—Another giant "Six," fully-fitted sensation. Brilliant new exterior, 6.9 cubic foot capacity, with Glass-Topped Sliding Hydrator, all Double-Easy Quickube Trays with built-in tray release, one Double-Width Dessert Tray. Sells for only **$127.75***

FULLY-FITTED S-6—A bargain price for a fully-fitted Frigidaire, packed with features including Super-powered Meter-Miser, Quickube Trays, Frozen Storage Space, Sliding Hydrator. It costs only . **$117.75***

*All prices quoted are Dayton delivered prices, and include installation, Federal Taxes and 5-Year Protection Plan. Transportation, state and local taxes (if any) extra. **All prices subject to change without notice.**

SCORES AGAIN in '41

For '41
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Brilliant new beauty!

A world-famous designer creates for Frigidaire completely new concepts of a refrigerator as a beauty note in the kitchen! Now you have striking new step-ups in styling as well as in features!

Use less current!

The bigger, roomier 1941 Frigidaire "Sixes" have 22% more power to keep food better and freeze ice faster! Yet they *cost less to operate* than any previous comparable models.

More useful than ever!

New food compartments—bigger and roomier! New *Frozen Storage Compartments* up to 74% bigger! Shelves adjustable! Even six cu. ft. model selling for only $117.75* is *fully-fitted,* including Hydrator moist storage and Quickube ice service!

Sensational new values!

More than a dozen brilliant models to choose from—every one a bargain-priced value. Cold-Wall prices are down as much as $53. Lowest price ever for a standard Frigidaire "Six" with Quickube Trays—only . . . **$112.75***

—And Here are the New

1941 FRIGIDAIRE *Electric* RANGES

Two Beautiful Series—Eight models, Brilliantly New Inside and out!

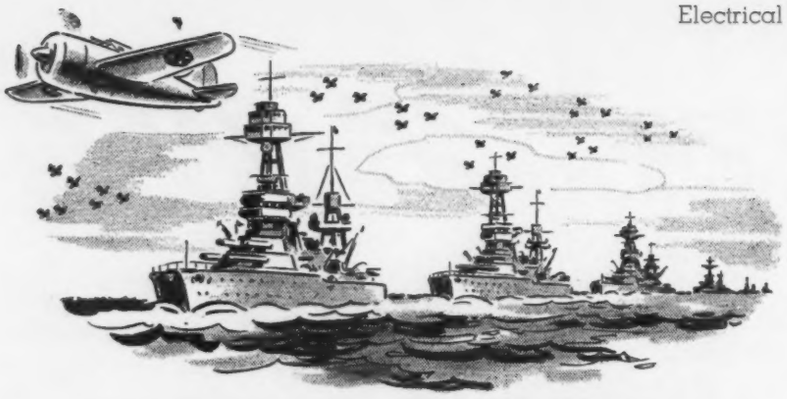
- New beauty!
- More useful—faster!
- Use less current!
- Sensational new values!

Typical of Frigidaire Electric Range values for 1941 is De Luxe Model B-60. It has the Exclusive New Radiantube Units, Ultra-Modern Fluorescent Lighting, "Cook-Master," Automatic Oven Light, Time Signal, Warming Drawer, Thrifto-Matic Switch, Simpli-Matic Oven Control, plus the dozens of other Frigidaire standard features.

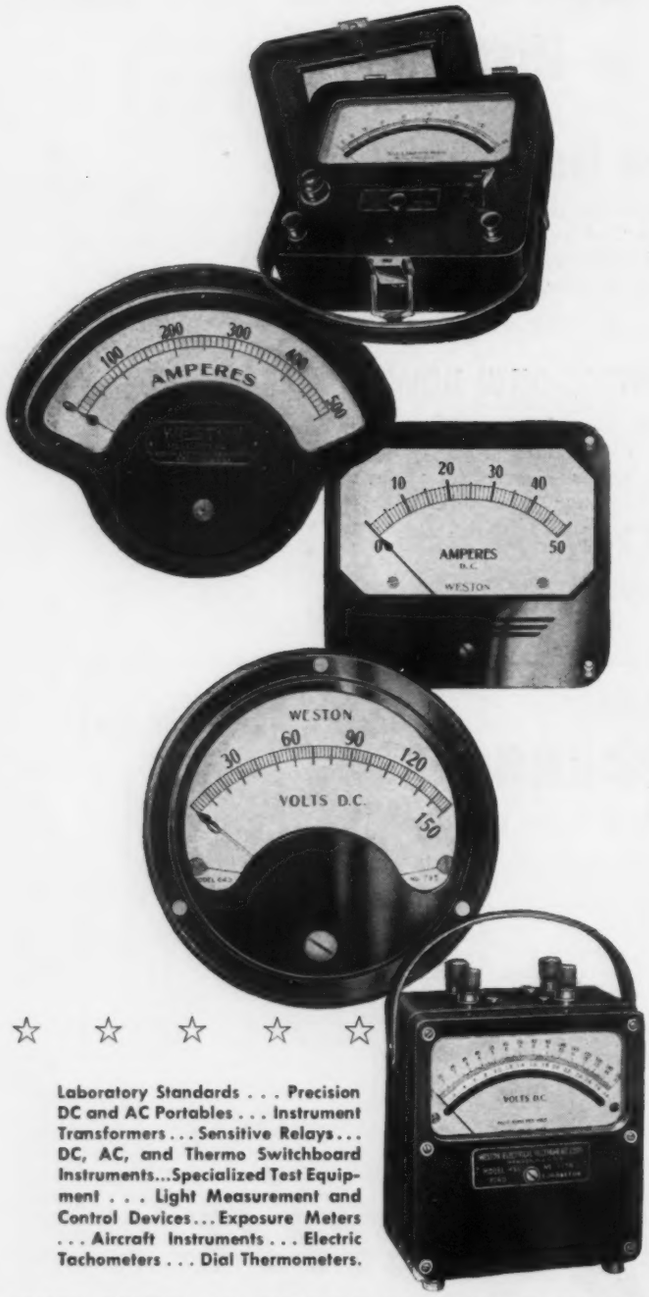
Watch the favorite

Watch Frigidaire

. . . over 6 million built and sold



BULWARKS . . .



against hazards . . . uncertainty . . . chance

A two-ocean navy . . . fifty thousand planes . . . millions for tanks and guns . . . these are the bulwarks America is building to free our future from hazard or chance. So industry rolls up its sleeves, in an "all-out" effort to produce these defense armaments on time . . . while they still can prove effective. Shortly, every tool of industry will be "on the line" . . . and full, uninterrupted work output will be expected. All production hazards . . . all factors which might retard or interrupt the continuous, peak operations of machines and tools, *must be eliminated.* For when the workers of a nation *must* produce . . . *tools must not fail them!* In this "speed-up" program, with uninterrupted work flow so vital, WESTON instruments continue in their accustomed role. For these are the bulwarks behind which fighters for vital production in laboratories, factories and power plants rout error, inefficiency and waste. These are the measurement standards which have earned industry's confidence as *tools which will not fail!* Weston Electrical Instrument Corp., 577 Frelinghuysen Avenue, Newark, New Jersey.

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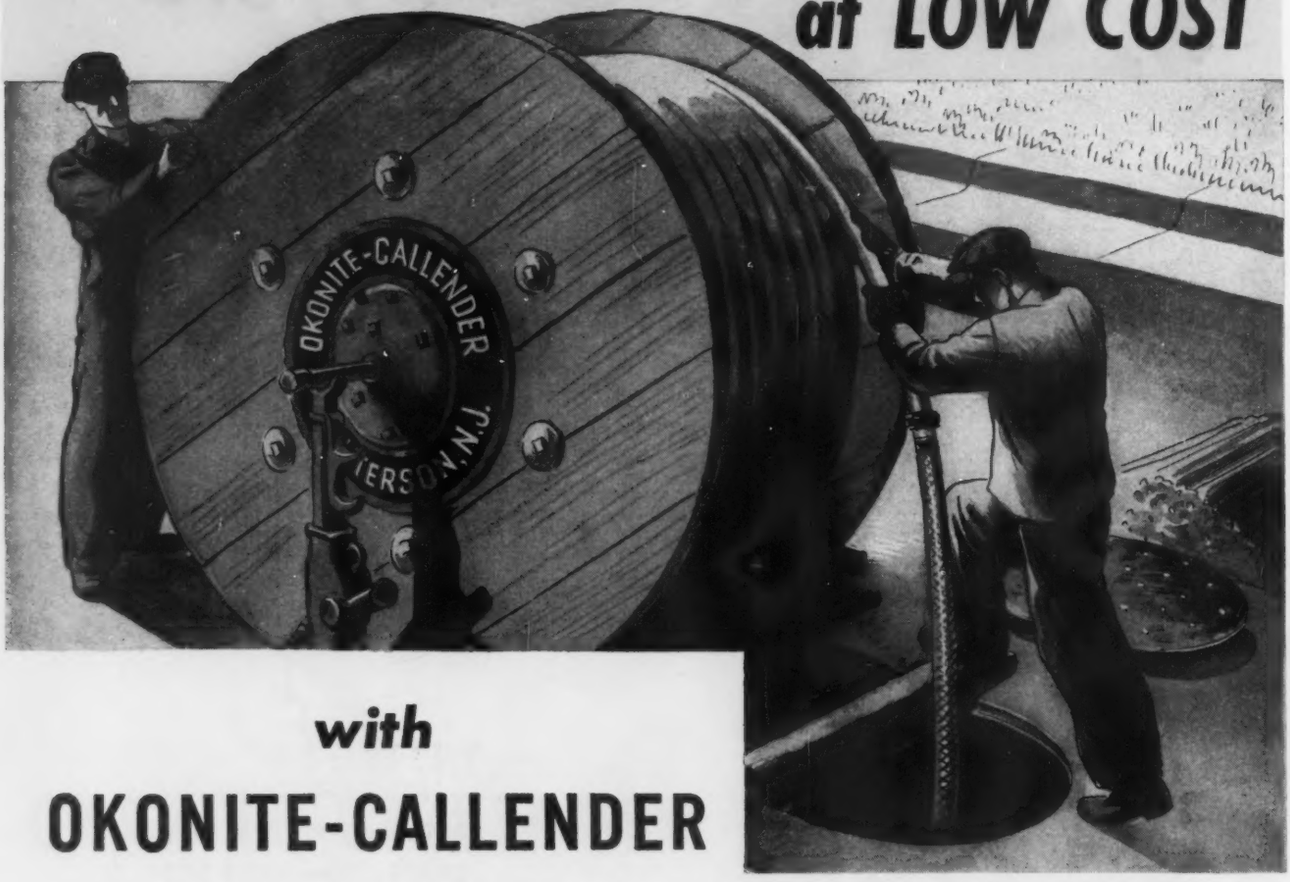

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Continuous research has been responsible for part of this record. Constant improvement of production equipment has aided in its betterment and a major contribution made by the factory itself, the only one in the country designed from laboratory to loading platform for the one purpose of manufacturing paper insulated power cables. The Okonite-Callender Cable Co., Inc., Passaic, N. J., offices in principal cities.

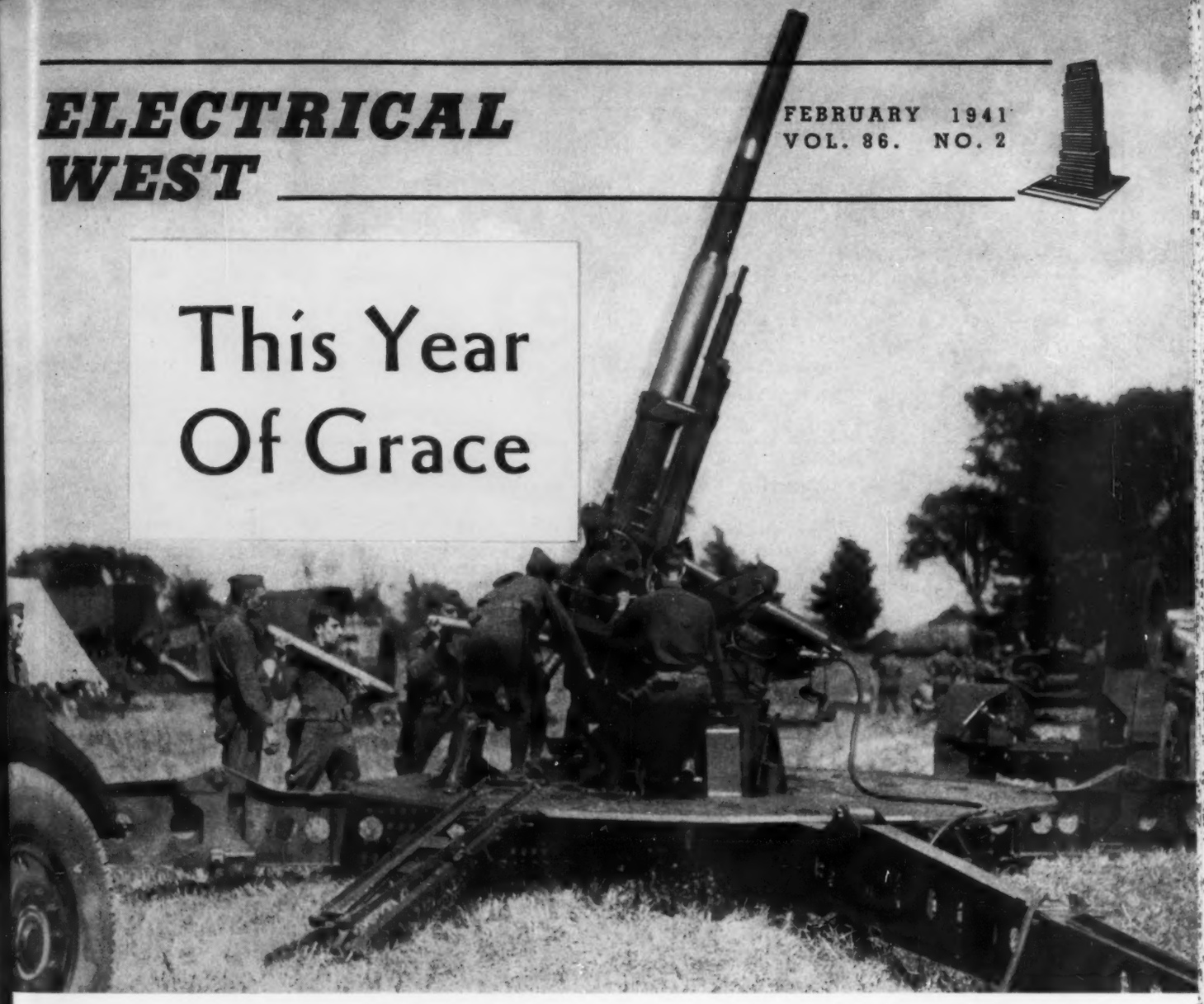
OKONITE-CALLENDER

PAPER INSULATED CABLES

ELECTRICAL WEST

FEBRUARY 1941
VOL. 86. NO. 2

This Year Of Grace



U. S. Army Signal Corps Photo

WHEN Uncle Sam bared his arm for a blood transfusion to the democracies and then left his sleeves rolled up for an all-out defense effort, he levied new and heavy responsibilities on the man power, the money power, the machine power and the electric power of the nation. Although national defense did not seriously affect the operations of the electrical industry here in the West in 1940, what it will do in 1941 is problematical. But whatever the demands, the electrical industry will be ready. The industry has that kind of a background. For years it has anticipated requirements for service and has been ready when the customer has said, "We need electric power here." In the defense emergency it can and will improve upon past performance.

Let's look at last year's performance: Twenty-four and a half billion kilowatthours tumbled out of the West's generating stations—10.8% more than in 1939 and 50% more than in that golden year, 1929. Electric service was provided for more people and more industries than ever before. Yet at the rate 1941 is starting out, this year's demands may be up as much as 15%. More people—as many as half a million more in cantonments, camps and bases—and more industries, most of them with a distinctly defense flavor, will require it.

For a quick summary of 1940 operations, study Table I on the following page. It reveals some significant facts, principally dealing with the intensity of Western electrification and the extent to which hydroelectric power contributes to that electrification. More than one-third of the developed water power is in the Western states, and 85% of the region's power requirements are supplied by hydro.

State by state the West has grown electrically in the last decade as examination of Table II will show. Arizona and Nevada have developed in power-producing stature since Boulder Dam was finished in 1936. Table III sets down utility customers by classes. Upwards of 160,000 new customers were added during the year, almost 140,000 of them in the residential classification. Just added proof of the oft repeated contention that the West is the fastest growing section of the nation (see map).

From the pages that make up this annual review number there may be gleaned many relevant facts about the industry in 1940 and in 1941:

Last year more energy-consuming appliances were sold in the West than in any previous year—357,000 refrigerators, 72,758 electric ranges and 32,542 water heaters. One might think that such a record would call for a rest on the oars by the industry's selling crews. But the quotas set for '41 won't permit it—an estimated 2% increase in refrigerator sales, 4.5% increase in ranges and 19% increase in water heaters. The whole industry is bullish on appliances and hopeful that defense priorities won't interfere with supplies.

Last year forty private and municipal

Table I—Comparison of Western to National Operations for 1939 and 1940

	11 Western States		United States		Per Cent West to U.S.	
	1939	1940	1939	1940	1939	1940
Energy Generated (Millions of kw.-hr.)	22,024	24,410*	130,336	144,600*	16.9	17.0
Energy Generated in Hydro Plants (Millions of kw.-hr.)	18,216	20,800*	44,022	47,300*	41.3	44.0
Energy Generated in Fuel Plants (Millions of kw.-hr.)	3,808	3,610*	86,314	97,300*	4.4	3.7
Percentage of Hydro to Total Generated	82.7	85.3	33.8	32.7		
Installed Generator Capacity (kw.)†	6,378,619	6,349,095	40,203,969	41,000,079	15.9	15.5
Installed Hydro Capacity (kw.)†	4,292,097	4,205,419	11,353,925	11,555,821	37.9	36.6
Revenue from Energy Sales (Thousands of dollars)‡	309,000	328,000	2,289,583	2,413,234	13.5	13.6

Twelve months ending November. † Source: Federal Power Commission. ‡ Data from EEI.

Table II—Ten-Year Generation Record for Western Public Utilities

State	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940*
Arizona	384,443	404,309	280,898	295,688	344,939	377,797	510,483	693,524	676,349	1,327,485	1,418,757
California	8,948,326	8,796,177	7,948,505	8,023,243	8,562,056	9,060,296	10,091,716	9,598,651	9,391,340	9,403,588	9,712,891
Colorado	573,341	528,817	478,263	459,453	506,710	549,157	652,404	682,222	693,344	760,445	752,211
Idaho	911,709	796,484	584,589	594,428	685,069	672,466	796,430	972,212	992,278	1,126,516	1,171,027
Montana	1,319,800	966,097	635,093	922,814	867,504	1,296,199	1,452,390	1,319,637	1,324,151	1,575,016	1,755,357
Nevada	42,895	19,006	32,749	24,231	32,152	27,719	171,499	1,152,788	1,491,205	1,855,042	1,278,772
New Mexico	75,871	179,658	157,611	157,482	173,233	190,744	214,602	254,880	261,717	281,508	313,736
Oregon	1,219,250	1,176,987	968,980	965,748	1,002,328	1,083,818	1,250,421	1,391,715	1,253,134	1,484,468	1,703,088
Utah	292,550	276,483	275,476	327,379	206,679	309,835	418,194	507,415	340,172	425,474	568,829
Washington	2,555,233	2,572,134	2,486,754	2,438,832	2,747,366	2,981,621	3,273,148	3,727,223	3,393,036	3,642,610	3,895,154
Wyoming	98,215	94,539	84,633	78,964	81,856	93,779	114,755	130,007	137,956	141,135	181,137

* F P C reports for twelve months ending November.

electric systems spent a total of $70,385,000 for extensions and betterments. They have budgeted $78,275,000 for 1941, an increase of 11.2%. Projects to insure ample power supplies for national defense predominate. Federal power expenditures swell the Western totals to a huge figure. Government projects in the area—Bonneville, Grand Coulee, Parker, Fort Peck, Colorado-Big Thompson, Boulder, Shasta—will have appropriations totaling $62,000,000. This latter figure is 41% of the federal government's allocations for power projects.

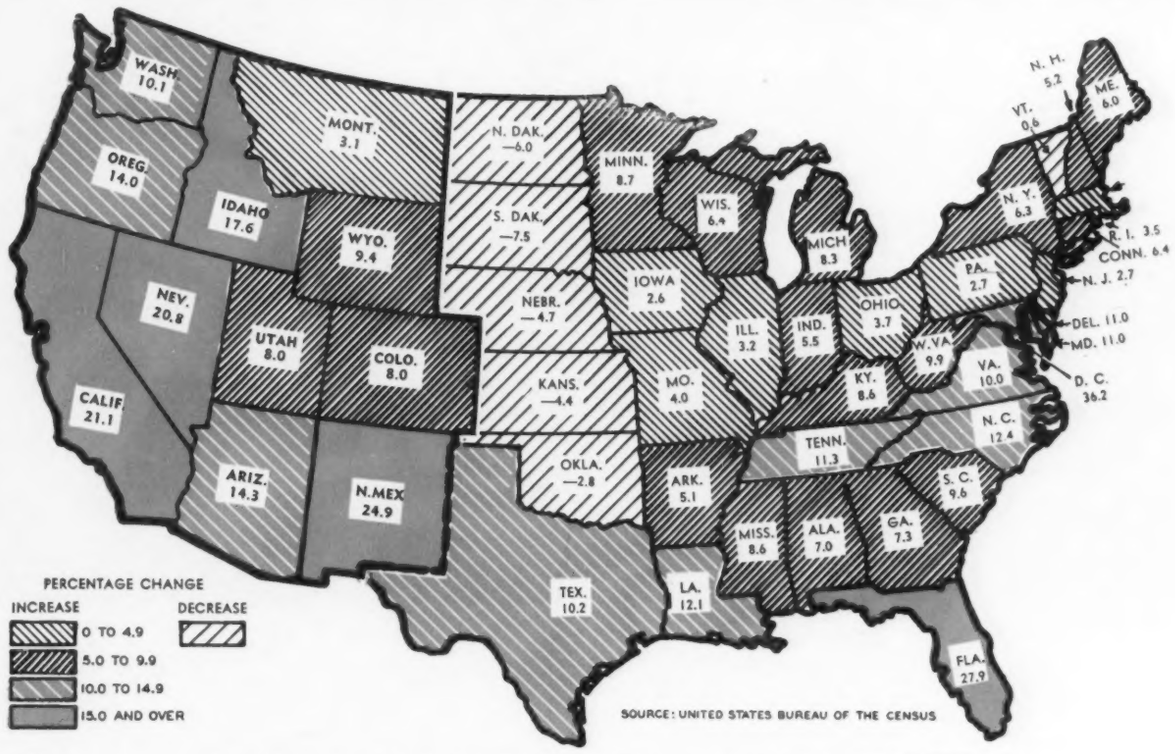
It seemed like 1939 was a big year in construction because residential building hit a 15-year high. Well, 1940 brought some really astronomical figures—total permits of $660,000,000, a 74% increase over 1939! A considerable portion of this was national defense construction, but more than $300,000,000 was in new residential occupancies, which sets a new record for the region. Even so, experts are predicting that 1941 figures may eclipse this total. They point to serious housing shortages in many communities where defense projects are swelling population.

Although much new industrial business developed in 1940, there is every indication that this year will top it substantially. Reason lies in the amount of national defense industry in sight. More than 17% of all national defense contracts let since last June 13 (the total exceeds $12 billions) have been awarded to Pacific Coast firms. About $157 millions has been allotted to camps, cantonments, air and naval bases, depots and airports. The balance is for ships and airplanes—$925 millions for vessels and $750 millions for aircraft. Translated into electrical terms, these figures mean about 51,000 kw. of additional demand for shipbuilding and 20,000 kw. for airplane factories.

Studies show that a riveted ship requires 172 kw.-hr. per ton of hull fabricated and that a welded vessel takes 326 kw.-hr. Most of the new vessels are welded—"sewed together" one Western shipbuilder calls it. In the aircraft factories similar studies show that about one-third of a kilowatt of demand is required per worker and that kilowatt-hour consumption will average about 1,500 per worker per year. By the end of 1941 there will be 179,000 people in Western aircraft factories.

So in 1941 power will be required to meet the normal demands of a fast-growing population, demands that have always exceeded those for any other section of the U. S. Homes, farms, factories, stores and buildings will expect normal electric service—adequate, reliable and low-cost. And on top of that will be a demand brought on by the defense emergency—power for camps and bases, for remote airfields, for new factories, some of which may be of the new black-out type. All of this will spell plenty of electrical activity here in the West.

For details as to where this activity will take place, and what it will mean in terms of such specific items as kva. of transformers or generators, miles of wire, and numbers of meters, consult the individual reports of Western systems, beginning on the following page.



The West grows fastest—population increase in per cent, 1930-1940

Table III—Utility Customers by Classes for 1939 and 1940

State	Rural Customers 1939	Rural Customers 1940	Residential Customers 1939	Residential Customers 1940	Commercial and Industrial 1939	Commercial and Industrial 1940	Municipal, Rail and Miscl. 1939	Municipal, Rail and Miscl. 1940	Total Customers 1939	Total Customers 1940
Arizona	1,451	1,600	79,857	82,000	16,053	16,380	284	313	97,645	100,293
California	69,569	71,000	1,718,275	1,805,000	375,964	388,200	11,815	11,720	2,175,623	2,275,920
Colorado	8,196	8,500	199,308	203,500	45,700	46,000	530	604	253,734	258,604
Idaho	3,489	4,000	94,069	101,000	17,328	17,660	1,393	1,446	116,279	124,106
Montana	3	0	97,405	103,000	17,399	17,620	1,424	1,397	116,228	122,020
Nevada	0	0	21,011	22,000	4,416	4,700	40	45	25,467	26,745
New Mexico	4	0	37,851	39,300	9,563	10,000	187	195	47,601	49,499
Oregon	7,312	8,700	241,408	258,000	46,697	46,200	1,636	1,436	297,053	314,336
Utah	584	630	116,189	117,000	14,097	13,330	908	878	131,778	131,838
Washington	18,558	20,000	428,852	441,000	70,584	71,700	2,289	2,424	520,283	535,124
Wyoming	314	370	37,881	39,600	7,420	7,800	98	106	45,713	47,876
11 Western States	109,473	114,807	3,072,106	3,211,400	625,221	639,590	20,604	20,564	3,827,404	3,986,361
United States	634,249	686,127	23,965,035	24,850,500	4,399,553	4,441,702	106,469	113,159	29,105,306	30,091,488

Source: Edison Electric Institute. 1940 Estimated on 10 months' data. Losses in general are due to reclassifications.
Editor's Note: This tabulation has been reclassified to agree with FPC classifications; hence figures above are not comparable with those published in previous years. This applies particularly to "Rural," which now include only those customers having distinct rural rates, and "Commercial."

Table IV—Type and Capacity of Utility Generators, October, 1940

State	Companies*	Plants	Total Capacity Kw.	Generator Capacity of Plants Operated by One Type of Prime Mover: Water Power No.	Water Power Kw.	Steam Power No.	Steam Power Kw.	Internal Comb. Engines No.	Internal Comb. Engines Kw.	Combination of Two or More Types: Total No.	Total Kw.	Water Power Kw.	Steam Power Kw.	Int. Comb. Engines Kw.
Arizona	23	47	431,396	12	293,075	8	86,710	21	26,226	6	25,385	40	7,217	18,128
California	35	158	2,681,133	115	1,539,315	28	1,087,750	12	49,496	3	4,570	3,650	0	920
Colorado	39	80	287,959	22	64,682	29	210,029	21	10,058	8	3,190	1,438	575	1,177
Idaho	18	49	261,140	37	254,781	3	850	4	1,729	5	3,780	2,620	0	1,160
Montana	12	31	335,844	18	321,185	4	10,265	6	1,762	3	2,632	180	1,506	946
Nevada	8	13	509,127	7	503,350	0	0	3	2,121	3	3,656	540	2,500	616
New Mexico	19	39	111,645	1	80	11	90,745	24	15,824	3	4,996	788	1,134	3,074
Oregon	30	75	462,129	47	476,492	19	178,200	5	1,067	4	6,370	2,030	300	4,040
Utah	25	65	161,047	48	87,922	2	59,750	6	3,595	9	9,780	3,990	0	5,790
Washington	31	68	1,020,009	48	797,671	13	217,420	4	1,202	3	3,716	2,140	1,080	496
Wyoming	28	43	87,666	10	47,770	18	33,529	10	3,687	5	2,680	1,680	300	700
11 Western States	168	668	6,349,095	365	4,186,323	135	1,975,248	116	121,269	52	70,755	19,096	14,612	37,047
United States	1,782	3,910	41,000,079	1,419	11,336,405	1,140	27,981,016	1,122	779,684	279	902,974	219,416	545,298	138,260

*Totals include duplications because of interstate operations. Data are for October 1, 1940. Source: Federal Power Commission.

Construction for '40 and '41

Private and municipal systems schedule 11.2% increase for 1941; outlay for year will exceed $78,000,000 plus $68,000,000 for federal power installations in West; launching of numerous generating installations, both steam and hydro, will characterize year; PG and E's $27,000,000 budget tops list; emphasis is on defense

Reports appear alphabetically under each state:

Arizona	45	Nevada	53
California	46	New Mexico	54
Colorado	51	Oregon	54
Federal	44	Utah	57
Idaho	52	Washington	57
Montana	53	Wyoming	59

Direct reports on 51 Western systems and projects, appearing below, include every major operation and present a 1940 construction summary and a 1941 preview which are virtually complete. Generous are the chief engineers and other executives of Western private and municipal systems and of federal agencies, whose detailed reports make possible this study.

An addition in round numbers shows the following measure of plant-expansion activities by forty private and municipal systems in the eleven Western States:

Spent in 1940	$70,385,000
Budgeted for 1941	$78,275,000
Increase	11.2%

A year ago these systems budgeted 80 million, but a $7,000,000 curtailment by the Los Angeles Bureau, and a $4,000,000 postponement by P G and E caused the reduction.

In addition to the above are federal expenditures, expected to total $68,000,000 during 1941, bringing the grand total for the year's power additions in the West to $140,000,000. First paragraphs of the following reports summarize activities of the systems for 1940 and 1941.

Federal

Bonneville

Report of the Bonneville Power Administration appears on p. 54, and tables on pp. 56-57. Report of the Army, Corps of Engineers, is on p. 55.

Bureau of Reclamation

Although the construction program of the Bureau of Reclamation may not be greatly expanded during 1941, the current projects will undoubtedly be carried on as scheduled. Appropriations totalling $60,847,000 were made available for the fiscal year 1941 to continue work on projects under construction or investigation.

The year 1940 saw the Grand Coulee Dam approaching completion while concrete placement was actively under way on Shasta and Friant Dams and the final stage of Marshall Ford Dam. Summaries of 1940-41 programs appear below according to states in which the projects are situated and a tabulation appears on p. 53.—*S. O. Harper, chief engineer.*

Rural Electrification

Rural electrification in the West continued at an increased rate during 1940. The status of the projects is tabulated on p. 48. While statistics are not yet available for the calendar year, 27,881 Western farms were connected to the highlines of private utilities, REA cooperatives and public power districts for the first time between June 30, 1939, and June 30, 1940. On the latter date, 313,800 farms in the eleven States west of the 100° meridian were electrified. These represented 54.9% of all farms in the area.

Fiscal 1940 saw an increase of 4.9% in total Western rural electrification, larger by 25% than the average increase for the six years since 1934. Twenty-two out of every 100 farms in the West have been electrified in those six years, while the entire span of 52 years before 1934 resulted in the electrification of only 32.7 of each 100 farms.

Allotments by REA in Western States during calendar 1940 totalled $9,661,000. Total REA allotments now amount to $28,177,848. The continually increasing momentum of the program is also reflected in these figures. During the first three and a half years of its activities, REA allotted $11,103,850. Loans during 1939 alone totalled $7,471,500. Applications approved through 1940 represent an increase of approximately $2,200,000 over the previous year.

Unofficial estimates for 1941 point to continued growth. Cooperatives, public utility districts, and other REA borrowers now have on file applications for approximately $4,500,000 in loans. In addition, surveys are being made in preparation for further applications

which are expected to total about $6,500,000. These plans are exclusive of new developments which may be expected during 1941. Of course, actual results will depend upon Congressional appropriations for rural electrification, and the feasibility of the projects developed.—*Information Section, REA.*

Arizona

Arizona Edison

We spent in electric improvements in 1940 approximately $140,000. This improvement was mainly in the distribution system and improving generating plant facilities with no increase in generating capacity. The budget figure for 1941 will be $120.000, also with no additions planned to generating plants or transmission lines.

The general outlook for 1941 is optimistic, with increase in number of customers and electric consumption expected to equal the increase in the previous year.—*Ralph T. Smalley, vice-president.*

Arizona Power

Expenditures for 1940 on new and improved facilties were $117,000. We contemplate the expenditure of $135,000 for similar purposes in 1941.

Largest construction item in 1940 was the installation of a new outdoor steel substation at Childs Hydro Plant for the outgoing 44-kv. circuits. We also continued the four-year program of rebuilding our Verde line, a 44-kv. "H"-frame line connecting our hydro and steam plants.

Expenditures contemplated for 1941 are mainly for new business, the completion of the rebuild of the Verde line and an addition to the outdoor substation at Childs.—*Malcolm M. Bridgwater, general superintendent*

Central Arizona Power

Our 1940 construction expenditures for new and improved electric facilities amounted to approximately $860,000. Budgeted amount at the beginning of the year was only $324.000. The increase was due to the installation of a 15,000-kw. turbo-generator at the steam electric station west of Phoenix, the building of 19 miles of 66-kv. transmission line, a substation, and other smaller items necessary to meet larger demands for electric service.

Installation of the 15,000-kw. generating unit became necessary due to increased pumping demands and shortage of hydroelectric power in central Arizona. The unit was purchased from an eastern industrial concern having excess generating capacity; and was reinstalled at the Phoenix plant in record time of ninety days ready for generation.

The 66-kv. transmission system was extended 19 miles west of Buckeye to a substation of 750-kva. capacity to serve an irrigation project.

Distribution line mileage was increased approximately 25 miles during the year. The 1940 annual system peak reached 44.000 kw. compared with 34.000 kw. for 1939.

Our 1941 construction budget is set at $400,000, the principal expansion being at the Phoenix steam electric station, 66-kv. and 12-kv. substations providing facilities for receiving Parker Dam power. The Bureau of Reclamation has already started construction of a 90,000-kva., 154/66/12-kv. substation at our steam electric station to be completed when Parker Dam generating plant goes into operation. *L. K. Doutrick, vice-president and chief engineer.*

Parker Dam Power Project, USBR

Construction of the Parker power plant was in progress during 1940. Completion of the three 30,000-kva. generating units is scheduled for the early part of 1942. A 137-mi., 161-kv. transmission line between Phoenix and Parker was constructed and placed in service during 1940. Energy from the Boulder power plant is now being delivered over this line into the territory.

Construction of 116 mi. of 161-kv. transmission line between Parker and Gila projects was completed during 1940.

A 120-mi. of 66-kv. transmission line between Phoenix and Tucson, and 39 mi. of 66-kv. transmission line between Phoenix and Sacaton, and 50 mi. of 161-kv. transmission line between Blaisdell, and Drop No. 4 on All-American Canal will be under construction during 1941. S. A. McWilliams is construction engineer.

Salt River Valley Assn.

The Association has expended $1,100,000 during 1940 and has budgeted $2,000,000 for 1941. There was no new generating capacity installed during the year.

To utilize the maximum amount of energy available from the Boulder Dam the Association installed temporary substation facilities of 6,000 kva. and changed some of the customers' and some of its own equipment to operate on 60 cycles in place of 25 cycles. This change was made necessary by the diminishing stored water supply and consequent decrease in 25-cycle hydroelectric power. For the same reason no large increase in connected load was experienced, but there was a material increase in energy consumed over former years. The Association also purchased frequency changers with a total capacity of 14,000 kva., the installation to be completed in 1941.

About 15 miles of transmission and 50 miles of distribution lines were added during 1940.

The Association has contracted for the construction of a steam plant of 28,000-kw. capacity to be completed by August 1941. It is contemplated under the present program to construct 15 miles of transmission and 25 miles of distribution lines. There is no appreciable increase in connected load expected for the coming year, but the energy consumption should increase by approximately 10 per cent over the preceding year.—*F. L. Roe, superintendent of power.*

Tucson G., E. L. & P.

Our construction expenditures during the year 1940 were approximately $300,000 and it is estimated that a similar amount will be expended during 1941. No expenditures will be made for increased generating capacity, as we have entered into a contract with the Reclamation Bureau under which 15,000 kw. will be delivered to our company during the latter part of the year upon completion of the power plant at Parker Dam.

The year 1940 shows an increase of 8 per cent in sales of electrical energy and we anticipate that the increase in 1941 will be somewhat larger, due to the establishment of army camps and aviation training schools. The change-over of our distribution system from 2,300 volts to 4,150 volts has recently been started and will be continued.

An additional loan has recently been granted our company by the Rural Electrification Administration under which approximately 40 miles of lines will be built in the rural areas in the vicinity of Tucson.—*M. A. Pooler, president and general manager.*

California

Anaheim Light Dept.

A total of $3,850 was spent for new facilities during 1940 and $25,000 has been budgeted for 1941. Principal reason for the wide difference is due to our program of installing 1,800 kva. in capacitors and 57,000 ft. of 2/0, 2 and 4 wire for 1941.—*V. W. Hannum, superintendent.*

Burbank PS Dept.

The City of Burbank expended for new and improved facilities during 1940 $550,000, and has budgeted for 1941 approximately $1,000,000. The difference in the expenditures of the two years is caused by contracts maturing in 1941 (for steam plant machinery and equipment) which were executed in 1940. The budget for this department is prepared for fiscal years, and the figures given for the calendar year are approximate only.

The most noteworthy projects undertaken by the department during 1940 were the installation of a 10,000-kw. electric generating plant, increasing the capacity of the distribution substation by 5,000 kva. and the installation on the properties of the Lockheed Aircraft Corporation and the Vega Airplane Co. of substations of 5,000-kva. capacity, 34.5-kv. to 4.3-kv.

The city placed underground all the 4.3-kv. feeders which radiated out from the central distributing station. The average distance of these underground sections was 1,500 ft. Thirteen manholes, 50,000 ft. of 4-in. fibre conduits, and 20,000 ft. of 3-conductor, 5,000-volt, 350,000 c.m. paper-covered cable, was used in this project.

It is expected that 1941 will see the completion of the installation of a second 10,000-kva. unit in the steam plant, the further increase of 5,000 kva. capacity in the central distributing substation, and 2,250 kva. in distribution transformers.

It is anticipated that approximately 2,500 services will again be added to the system in 1941 which will require additional distribution feeders aggregating approximately 15 miles.—*J. H. McCambridge, superintendent.*

Central Valley Project, USBR

The first concrete was placed in Shasta Dam on July 8, 1940. The dam, being constructed on the Sacramento River near Redding, will be a slightly curved concrete gravity structure with an earth and rockfill embankment on the left abutment. The dam will have a maximum height of 560 feet, crest length 3500 feet, and a volume of 5,800,000 cubic yards. The earth and rockfill embankment on the left abutment will contain about 1,450,000 cubic yards of material. At the end of the year the dam was about 45% complete on a cost basis.

The Shasta power plant will be under construction during 1941. The installation of four 75,000-kva. main generators and two 2,500-kva. station-service generators will be in progress during the coming year, with completion of installation of the main units scheduled for early in 1942 and the station-service units in 1941. R. S. Calland is acting supervising engineer; Ralph Lowry, construction engineer, Kennett Division.

Coast Counties Gas & Electric

Our company spent during 1940 approximately $272,000 for new and improved facilities and has budgeted for the same purposes for 1941, $193,000. The principal reason for the difference in this amount is the fact that a small distribution substation was included in the 1941 budget, but a lesser amount of replacement work is being done on transmission lines.

During 1940, 7,500 kva. was added in transformer capacity; no transmission and approximately 20 miles of distribution lines. Net increase was 550 meters.

Our plans for 1941 anticipate about the same growth in the number of meters and miles of distribution lines, and that our gain in kilowatt-hour sales will be about equal to 1940.

It is also anticipated that approximately 1,500 kva. in capacitor installations will be made during the coming year.—*A. E. Strong, general superintendent.*

Glendale PS Dept.

In addition to the regular improvements and additions to its system the Public Service Department of Glendale has practically completed a new 20,000-kw. steam generating station. It is expected that this unit will be on the line sometime in February. The approximate amount expended during the year was $1,000,000 and in 1941 it is expected that approximately $600,000 will be spent for improvements.

The new plant consists of a 20,000-kw. turbo-generator; two boilers each of 200,000 lb. per hour capacity for operation at 600 lb. pressure and 825 deg. temperature. Provisions have been made for a second generating unit and third boiler in the present construction. A rather unique feature of the station is that it will be of the semi-outdoor type without the conventional superstructure over the turbine deck. In connection with the plant will be an outdoor 34-kv. switching station tying in with the city's 34-kv. transmission

system.

Little change was made at the substations or the distribution systems except for the installation of a 10,000-kva. transformer bank. Net increase in consumers was 1,400 meters or approximately 5 per cent, while the peak demand increased 11½ per cent and consumption about 10 per cent.—*P. Diederich, superintendent of public service.*

Imperial Irrigation District

During 1940 the district spent approximately $675,000 for new construction. This covered the completion of the two hydro plants on the All-American Canal and additions to substations and distribution lines.

The district made an installation of 3,000 c.-kva. in capacitors for power-factor correction. Small banks of capacitors were installed at various distribution substations. The year closed with a total of over 10,000 customers, which is an increase of 2,000 during the year.

The district does not contemplate any major construction during the year 1941 but will continue to extend the distribution lines as required for the connecting of new customers. Continued growth is anticipated. It is expected that power will be available from the hydro plants on the All-American Canal early in 1941.—*M. J. Dowd, chief engineer and general superintendent.*

Los Angeles Bureau of P&L

New and improved facilities on the general system during 1940 resulted in an expenditure of approximately $10,400.000. which included two and one-half million dollars for the completion of the third 275-kv. transmission circuit from Boulder power plant. Capital additions and betterments for the first six months of 1941 will approximate seven and one-half million dollars, as budgets are based on fiscal years ending June 30. Included in this amount is approximately two and one-quarter million dollars budgeted for construction work on a new steam plant located at the Los Angeles Harbor.

Early in 1940, one 82,500-kw. unit at Boulder power plant originally contracted for by the Metropolitan Water District of Southern California, was released by agreement with the district to the Bureau of Power and Light for a period of thirty-three months.

The last two sections of the third 275-kv. Bureau-owned transmission line between Boulder power plant and Los Angeles, together with the necessary additions at intervening and terminal switching stations, were completed and placed in operation early in May. The completion of these two sections added approximately 183 circuit miles to the transmission system and 100,000 kw. in effective system operating capacity.

Distribution system construction activities included: (Overhead) 42 pole-line miles of primary and secondary distribution and 21 circuit miles of 34.5-kv. lines; (Underground) 145 cable miles of primary and secondary line including services. Transformer capacity was increased 200,000 kva. and 28 regulated feeders were installed in the overhead and underground systems. A portion of this increase was occasioned by the acquisition of territories from the Southern California Edison Co. during the fiscal year 1939-1940. The net increase in meters and connected load was approximately 22,000 and 175,000 kw. respectively.

Construction at receiving and distributing stations included the installation of a 60,000-kva. synchronous condenser and the progressing of a switch modernization program whereby the older circuit breakers on the 34.5-kv. system are being rebuilt or replaced with breakers of improved design and greater interrupting capacity. Transformer changes and additions at existing distributing stations resulted in a net increase in capacity of 32,000 kva.

1941 Program

During 1941 hydro generating capacity will be increased by 165,000 kw. contingent upon the completion late in 1941 by the Bureau of Reclamation of two additional 82,500-kw. units at Boulder power plant.

Construction will be progressed on a new steam plant at Los Angeles Harbor, contracts having been placed for the first steam turbine generator unit of 65,000 kw. (at .8 p.f.) capacity, and its associated equipment. Under present construction schedules, it is planned to place this unit in service late in 1942.

The high voltage loop system connecting the various receiving stations will be expanded by an additional 132-kv. section to connect West Los Angeles with the San Fernando Valley District. The inclusion of approximately five miles of 1,500,000 cir. mill oil-filled cable in this section will mark the first installation of this character on the Bureau's system to operate at a potential of 132 kv.

Distribution activities are planned to include: (Overhead) 35 pole-line miles of primary and secondary distribution, 20 circuit miles of 34.5-kv. line; (Underground) 125 cable miles of primary, secondary, and service runs. Distribution transformer capacity will be increased approximately 90.000 kva. and 15 regulated feeders will be added to the overhead and underground system.

It is planned to construct one new receiving station having an initial transformer capacity of 150,000 kva. to better serve the western section of the city. Additions and changes at existing stations will result in a net capacity addition of approximately 50,000 kva. Several temporary stations are scheduled for replacement with permanent installations of greater capacity. This program includes construction of one new outdoor and two new major distributing stations varying from 15,000 to 30,000 kva. and up to 30 feeder positions per station.

It is anticipated that approximately 22,000 meters and 150,000 kw. in connected load will be added to the system during the coming year.—*H. C. Gardett, chief electrical engineer and general manager.*

Nev-Cal Electric

On this system the 1940 expenditures for new and improved facilities amounted to $903.859. The 1941 budget provides $1.023,235 for the same class of expenditure and includes improvements and additions to production, transmission, and distribution facilities. The principal addition will be in distribution facilities.

Work carried on during 1940 included no new additions to generating plant. Transformer capacity increases amounted to 4,000 kva. at distribution substations during the year. Some 83 miles of transmission line were added, and additions to distribution system mileage amounted to 83 miles as well. The program for 1941 provides for converting one hydro plant to semi-automatic operation and contemplates the expenditure of $75,000 on transmission system improvements. Additions and improvements in distribution facilities to the amount of $760,000 are planned. This item will include increases of 8,850 kva. in substation capacity and additions to the 33-kv. system mileage and to the lines of lower voltage.—*R. H. Halpenny, electrical engineer.*

Pacific Gas and Electric

Construction activities of the Pacific Gas and Electric Co. for 1940 required the expenditure of some $26,000,000 for expansion and improvement of its electrical facilities, an increase of approximately $2,000,000 over 1939 expenditures. The corresponding activities in 1941 are budgeted at $27,000,000.

Many of the items budgeted are a continuation of projects laid down in the year just closed. The increase in the 1941 budget is necessary to provide adequate service for the large expansion of industrial activities now in progress, as well as for normal system growth of load in other classes.

1940 Program

PRODUCTION — At the opening of 1940, the company's steam-electric gen-

erating program, comprising the construction of three 50,000-kva. stations, was in full swing. Of these, the Avon plant has been completed, the Martinez plant is programmed for completion in March 1941, and the Oleum plant in July. These are 1,450-lb., 950-deg.-F. plants, built at a combined cost of some $15,000,000.

Reconstruction work on three small hydroelectric generating plants at Potter Valley, Phoenix, and Junction City, respectively, started in 1939, was completed in 1940, modernizing the generating equipment and arranging it for full or semi-automatic operation.

During the year, the boring of the 4½-mile tunnel for the Colgate plant, on the Yuba River, was completed at a total cost of about $1,400,000. The new tunnel replaces a timber flume of much greater length with attendant saving in water wastage and maintenance expense.

TRANSMISSION—In this field a considerable number of items, widely scattered throughout the system, were completed. The 110-kv. twin-circuit tower line from the Avon and Martinez steam plants to Newark Substation begun in 1939, was completed in 1940. A 110-kv. tap was constructed to serve the Ames aeronautical laboratory at Moffett Field. New or re-routed 60-kv. lines were installed between Salinas and Del Monte, between Herdlvn and Newark, and in the vicinity of Chico.

The increased delivery of energy at load centers called for extensive substation construction throughout the system. Work was started on the Piedra Substation near Fresno, and on the enlargement of Magunden Substation in Kern County. These two substations are the chief connecting links for the purchase of power from the Southern California Edison Co. These stations step the voltage from 220 kv. to 110 and 70 kv. respectively, and have a combined installed capacity of 175,000 kw.

Work to cost $760,000 is well under way at the San Mateo Substation. Substations at Valley Home and at Moffett Field, to serve the Ames Laboratory, were completed. Reconstruction work was completed in substations at Colusa, Brighton, Orland, and Eureka. Throughout the system, a general shifting of transformers and additions of transformer capacity, have been in progress.

DISTRIBUTION — Normal growth of load in 1940 has required a continuous increase in distribution facilities. The completion of some 1,200 miles of distribution lines raises the total of distribution and transmission lines — both overhead and underground—in the system to some 40,000 miles. An integral part of this increased mileage is in connection with the program of rural line extension on which approximately $1,000,000 was spent in 1940. During 1940, some 33,000 new meters were set throughout the system.

WESTERN REA SYSTEMS

System	Borrower's Name	Cumulative Allotments‡	1940 Allotment	Consumers (a) Connected
ARIZONA	**State Total**	$ 913,000	$ 210,000	607
2 S.E.*	Stonewall Electric Co., Tucson	100,000	35,000	130
4 Pinal*	San Carlos Irr. and Drainage Dist., Coolidge	145,000	.....	281
14 Cochise*	Sulphur Springs Val. Elec. Coop., Inc., Willcox	668,000	175,000	196
CALIFORNIA	**State Total**	$1,868,500	$ 120,000	3448
1 Imperial*	Imperial Irrig. Dist., Imperial	700,000	.....	1800
6 Modoc*	Surprise Val. Electrification Corp., Alturas	704,500	45,000	775
16 Plumas*	Plumas-Sierra Rural Elec. Coop., Portola	328,000	20,000	546
18 San Diego*	Mountain Empire Electric Coop., Inc., Campo	136,000	55,000	327 (b)
COLORADO	**State Total**	$5,492,000	$2,139,500	5833
7 Mesa*	Grand Val. Rural P. Lines, Inc., Grand Junction	340,500	122,500	742
14 Alamosa*	San Luis Val. Rural Elec. Coop., Inc., Monte Vista	387,500	5,000	939
15 Morgan*	Morgan County Rural Elec. Ass., Fort Morgan	605,000	.....	700
16 Jefferson*	The Intermountain Rural Elec. Assn., Bailey	347,000	233,000	253
17 Prowers*	Southeast Colo. Power Assn., La Junta	727,500	40,000	1178
18 Gunnison	Gunnison County Elec. Assn., Inc., Crested Butte	158,000	158,000	...
20 Delta*	Delta-Montrose Rural P. Lines Assn., Delta	588,000	86,000	769
21 S. E.*	Stonewall Electric Co., Trinidad	39,000	.....	140
22 Boulder*	Union Rural Elec. Assn., Inc., Brighton	405,000	130,000	677
25 Pueblo	San Isabel Elec. Assn., Inc., Beulah	119,000	119,000	...
26 San Miguel*	San Miguel P. Assn., Inc., Norwood	174,000	.....	247
29 Phillips*	Highline Elec. Assn., Holyoke	451,500	326,000	188
31 Larimer	Poudre Valley Rural Elec. Assn., Inc., Severance	586,000	356,000	...
32 LaPlata	La Plata Elec. Assn., Inc., Ignacio	161,000	161,000	...
33 Dolores	Empire Elec. Assn., Inc., Dove Creek	123,000	123,000	...
34 Eagle	Holy Cross Elec. Assn., Inc., Basalt	123,000	123,000	...
36 Routt	Yampa Valley Elec. Assn., Inc., Steamboat Springs	157,000	157,000	...
IDAHO	**State Total**	$3,013,750	$ 555,000	4181
4 & 6 Bonner*	N. Ida. Rur. Elec. Rehabilitation Assn., Inc., Sand Pointe	485,750	.....	723
10 Nez Perce*	Clearwater Val. L. & P. Assn., Inc., Lewiston	1,264,800	192,000	2022
11 Kootenai*	Kootenai Rur. Elec. Assn., Inc., Coeur d'Alene	284,000	20,000	567
14 Valley	Long Valley P. Coop., Lake Fork	119,000	119,000	...
15 Idaho*	Idaho County L. & P. Coop. Assn., Inc., Grangeville	339,000	.....	526
16 Cassia	Raft River Rur. Elec. Coop., Inc., Malta	116,000	.....	...
17 Fremont*	Fall River Rur. Elec. Coop., Inc., Ashton	234,000	52,000	343
19 Butte	Lost River Elec. Coop., Inc., Arco	82,000	82,000	...
21 Camas	Prairie P. Coop., Inc., Fairfield	90,000	90,000	...
MONTANA	**State Total**	$3,307,598.17	$926,000	4781
1 Ravalli*	Ravalli County Elec. Coop., Inc., Corvallis	187,800	.....	381
2 Cascade*	Sun River Elec. Coop., Inc., Fairfield	482,500	155,000	839
5 Richland*	Lower Yellowstone Rur. Elec. Assn., Sidney	176,600	32,000	367
9 Yellowstone*	Yellowstone Valley Elec. Coop., Inc., Huntley	376,498.17	.....	970
10 Madison*	Vigilante Elec. Coop., Inc., Twin Bridges	270,000	.....	533
11 Sanders*	Sanders Elec. Coop., Inc., Trout Creek	128,000	.....	155
12 Missoula*	Missoula Elec. Coop., Inc., Missoula	257,000	35,000	246
13 Flathead*	Flathead Elec. Coop., Inc., Kalispell	243,700	.....	518
15 Fergus*	Fergus Elec. Coop., Inc., Lewiston	386,000	160,000	313
16 Park*	Park Elec. Coop., Inc., Livingston	124,000	5,000	221
17 Rosebud*	Mid-Yellowstone Elec. Coop., Inc., Hysham	188,500	52,000	238
19 Stillwater	Beartooth Elec. Coop., Inc. Absarokee	294,000	294,000	...
21 Big Horn	Big Horn County Elec. Coop., Inc., Hardin	193,000	193,000	...
NEVADA	**State Total**	$ 227,000	.....	439
4 Overton*	Overton Power Dist. No. 5, Overton	227,000	.....	439
NEW MEXICO	**State Total**	$ 945,000	$ 235,000	1080
4 Eddy*	Central Valley. Elec. Coop., Inc., Artesia	329,000	17,000	334
5 Roosevelt*	Roosevelt County Elec. Coop., Inc., Portales	202,000	20,000	206
9 Curry*	Farmers' Elec. Coop., Inc., Clovis	264,000	48,000	540
12 Otero	Otero County Elec. Coop., Inc., Cloudcroft	150,000	150,000	...
OREGON	**State Total**	$3,223,500	$2,221,000	1853
2 Lane*	Blachly-Lane County Coop. Elec. Assn., Blachly	139,000	.....	269
4 Lincoln	Benton-Lincoln Elec. Coop., Inc., Corvallis	575,000	310,000	...
5 Clatsop*	Nehalem Val. Coop. Elec. Assn., Jewell	89,000	.....	321
14 Umatilla*	Umatilla Elec. Coop. Assn., Hermiston	263,000	5,000	667
16 Malheur*	Malheur Coop. Elec. Assn., Vale	240,000	240,000	262
17 Douglas*	West Douglas Elec. Coop., Inc., Roseburg	132,000	.....	326

Program for 1941

PRODUCTION—During the past year, engineering investigations and design work have been in progress on a new hydroelectric plant near Dutch Flat on the Bear River. A 5-mile pressure tunnel will be required, the boring of which was started in December 1940. The unit will consist of a 30,000-hp., vertical turbine, driving a 27,000-kw. generator. The cost of this plant has been estimated at $3.210,000. The general design of another plant on the Bear River, near Colfax, is also being studied. This will doubtless be of similar installed capacity and closely identical in design with the Dutch Flat plant.

The company plans to commence tunneling operations for the Cresta plant on the Feather River, in the spring of 1941. This will be of the pressure-type, about 4 miles in length and of a cross-section of 600 sq. ft. The power house installation will consist of two 46,500-hp., vertical turbines, each direct-connected to a 37,500-kva. generator. The cost of the project will approximate $11,100,000. It is anticipated that the plant will be in service in the summer of 1943.

Immediately below the proposed Cresta plant lies the Pulga development, which the company is planning to complete in the summer of 1944. The layout is very similar to that at

System	Borrower's Name	Cumulative Allotments‡	1940 Allotment	Consumers (a) Connected	
18 Eugene	Lane County Elec. Coop., Inc., Eugene	650,000	650,000	...	
19 Jordan Valley*	Jordan Valley Elec. Coop., Inc., Jordan Valley	30,000	30,000	8	
21 Coos	Coos Elec. Coop., Inc., Coquille	236,500	117,000	...	
22 Clackamas	N.E. Clackamas County Elec. Coop., Inc., Sandy	71,000	71,000	...	
25 Deschutes	Central Electric Coop., Inc., Redmond	250,000	250,000	...	
26 Wasco	Wasco Elec. Coop., Inc., The Dalles	240,000	240,000	...	
28 Oakland	North Douglas Elec. Coop., Inc., Roseburg	308,000	308,000	...	
UTAH	**State Total**	**$ 889,000**	**310,000**	**1374**	
6 Garfield*	Garkane Power Assn., Inc., Hatch	232,000	27,000	561	
7 P.L. & P.*	Peoples Light and Power Co., Loa	5,000	.....	40	
8 Duchesne*	Moon Lake Elec. Assn., Inc., Mt. Emmons	652,000	283,000	773	
WASHINGTON	**State Total**	**$6,118,700**	**$2,484,500**	**5723**	
8 Benton*	Benton Rur. Elec. Assn., Prosser	346,500	114,000	586	
9 San Juan*	Orcas Power & Light Co., Eastsound	476,000	341,000	247	
14 King*	Mutual P. & L. Assn. of Tanner, North Bend	22,200	.....	29	
17 Klickitat	PUD No. 1 of Klickitat County, White Salmon	100,000	100,000	...	
18 Spokane*	Inland Emp., Rur. Elec., Inc., Spokane	2,130,000	566,000	2440 (c)	
20 Columbia*	Columbia County Rur. Elec. Assn., Inc., Dayton	245,000	163,000	84	
23 Grays Harbor*	Quinault Light Co., Quinault	79,000	.....	144	
25 Cowlitz*	PUD No. 1 of Cowlitz County, Kelso	211,000	65,000	452	
27 Lewis*	PUD No. 1, Chehalis	416,500	57,000	684	
28 Kittitas*	PUD No. 1 of Kittitas County, Ellensburg	151,000	.. .	259	
29 Skamania	PUD No. 1 of Skamania County, Stevenson	28,000	28,000	...	
30 Stevens*	Stevens County Elec. Coop., Inc., Colville	596,000	265,000	140	
32 Okanogan*	Okanogan County Elec. Coop., Inc., Winthrop	154,500	88,500	100	
33 Mason	PUD No. 3 of Mason County, Shelton	51,000	51,000	...	
35 Pend Oreille*	Pend Oreille Elec. Coop., Inc., Newport	219,000	15,000	309	
36 Adams*	Big Bend Elec. Coop., Inc., Ritzville	262,000	.....	249	
37 Lincoln	Lincoln Elec., Coop., Inc., Davenport	448,000	448,000	...	
38 Douglas	Douglas County Elec. Coop., Inc., Waterville	75,000	75,000	...	
39 Nespelem	Nespelem Val. Elec. Coop., Inc., Nespelem	108,000	108,000	...	
WYOMING	**State Total**	**$2,179,800**	**$ 460,000**	**2884**	
3 Fremont*	Riverton Val. Elec. Assn., Inc., Riverton	251,000	86,000	275	
5 Big Horn*	Big Horn Rural Elec. Co., Basin	411,000	112,000	525	
6 Goshen*	Wyrulec Company, Lingle	243,000	.....	428	
9 Uinta*	Bridger Val. Elec. Assn., Inc., Mountain View	142,000	30,000	258	
10 Platte*	Wheatland Rur. Elec. Assn., Wheatland	80,000	.....	188	
11 Lincoln*	Lower Valley P. & L., Inc., Freedom	444,000	18,000	652	
12 Park*	Garland L. & P. Co., Powell	72,300	.....	161	
13 Washakie*	Washakie Rur. Elec. Co., Worland	56,500	.....	143	
14 Laramie*	Rural Electric Co., Pine Bluffs	406,000	164,000	254	
17 S. E.	Stonewall Elec. Co., Sheridan	74,000	50,000	...	

* Energized in part or in whole. ‡ Data shown are net; include allotments and rescissions through Dec. 31, 1940. (a) Oct. 31, 1940, except as noted. (b) Sept. 30, 1940. (c) July 31, 1940.

REA GENERATING PLANTS

Project	Location of Plant	KW Capacity	Type	Status
Arizona 14 Cochise	Near McNeal, Cochise County	1425	Nat. Gas-Diesel	Operating
California 6 Modoc	Near Alturas, Modoc County	857	Diesel	Operating
Colorado 18 Gunnison	Crested Butte, Gunnison County	300	Diesel	Allotted
Colorado 33 Dolores		100	Mobile Diesel	Allotted
Idaho 4 Bonner	Outlet of Priest Lake, Bonner Co.	...	Hydro	Allotted
New Mexico 12 Otero		120	Mobile Diesel	Under Const.
Oregon 2 Lane	Blachly, Lane County	150	Hydro	Operating
Oregon 16 Malheur		120	Mobile Diesel	Operating
Oregon 19 Jordan Valley		100	Mobile Diesel	Operating
Utah 6 Garfield	Hatch, Garfield County	200	Diesel	Operating
Utah 6 Garfield	Hatch, Garfield County	100	Diesel	Allotted
Utah 8 Duchesne	Near Mt. Emmons, Duchesne Co.	600	Hydro	Allotted
Washington 9 San Juan	San Juan, Orcas Island, San Juan Co.	250	Diesel	Operating
Washington 23 Grays Harbor	Quinault, Grays Harbor County	250	Hydro	Operating
Washington 27 Lewis	Randle, Lewis County	80	Diesel	Operating
Washington 27 Lewis	Randle, Lewis County	30	Hydro	Operating
Wyoming 9 Uinta	Lymar, Uinta County	112	Nat. Gas-Diesel	Operating
Wyoming 9 Uinta	Lymar, Uinta County	112	Nat. Gas Diesel	Under Const.
Wyoming 11 Lincoln	Near Freedom, Lincoln County	600	Hydro	Operating

Cresta except that the tunnel will be somewhat shorter. There will be two vertical units of 55,000 hp. each, connected to 45,000-kva. generators. Estimates place the cost of the completed plant at $10,220,000.

These hydro plants, which could be completed in from 2 to 3½ years, depending upon their size and construction features, would generate some 190,000 kw. of new peak and about 1,100 million kw.-hr. of additional energy.

TRANSMISSION—To deliver blocks of energy of this magnitude to the system at major load centers will necessitate the construction of a number of circuit miles of transmission lines. Work on the Dutch Flat 110-kv. transmission to Halsey Jct. for use through the Nicolaus Substation or an outlet through the Vaca-Dixon Substation, at a cost in excess of $550,000, is scheduled for 1941.

Construction of another 110-kv. line of some 30 circuit miles, from the new Oleum steam plant to the Claremont-Newark Line, will be started in 1941. A 110-kv. tap and a new industrial substation serving the Dow Chemical plant at Pittsburgh, are scheduled for early completion. Among items of 60-kv. construction programmed for next year, are a second circuit from Cordelia to Ignacio, the re-routing of the Standard Lines south of San Francisco, the re-routing of 2 sections in the vicinity of Shasta Dam, and the Nicolaus-Tudor Line.

The construction and reconstruction of both transmission and distribution substations will likewise receive attention next year. A new 50,000-kva. installation of 110/60-kv. transformers and related switching equipment, is planned at East Nicolaus, at a cost of $660,000. This will be similar in many respects to the San Mateo Substation now under construction. At Soledad Substation, new 110/60-kv. capacity will be installed, with provision for a future synchronous condenser.

From best available information, it now appears that the year 1941 will show a continuation of the increases in number of customers and in load which prevailed throughout 1940, possibly at moderately accelerated rates by reason of the national defense activities throughout the company's territory.—*W. G. B. Euler, chief engineer.*

Palo Alto

In round figures the amount spent for new and improved electric facilities in 1940 was $21,600, and the corresponding budgeted amount for 1941 is $28,000.

The principal projects of 1940, still in progress, are extensions of distribution system in two new residential tracts—one being for underground facilities and the other overhead by way of easements at rear of properties.

The additional connected load might be estimated at 450 kw. A total of 45 kva. of capacitors was added to the original 900 kva. installation.

The principal program scheduled for 1941 is additional street lighting in area adjoining the Southern Pacific subway and El Camino Real overpass project now being completed at the University Avenue entrance into Palo Alto. Probable transformer additions might amount to 300 kva. and 5 to 6 miles of distribution might be anticipated.—*A. V. Youens, electrical engineer.*

Pasadena Municipal L & P

Capital additions during the last fiscal year totalled $348,607. This amount was distributed as follows:

Production	12%
Transmission	14%
Distribution	67%
General	7%
	100%

During 1940 there was no addition to our generating plant. We have, however, completed the installation of an induced-draft cooling tower, normal cooling capacity, 17,500 gal. per min. which replaces old atmospheric cooling towers of much less capacity. Transformer capacity on the distribution system has been increased 1,630 kw. There has been no change in the length of

transmission lines but considerable expense has been incurred in re-routing portions of them.

We have continued our program of converting some of the 2,400-volt aerial system to underground and have also increased the size of wire and modified some feeders, with a net increase in length of about 4 mi. during the year. The number of meters has been increased by 641. We estimate that connected load added to our system during the year amounts to approximately 5,000 kw.

There is no substantial increase in generating facilities planned before about 1945. There will be the normal amount of expansion of distribution facilities to take care of growth. Increase in transformer capacity and length of lines will probably be about the same as this year. Pasadena being primarily a residential community and having very little industrial load, we will probably be very little affected by national defense developments.—*B. F. Delanty, general manager.*

Riverside Electric Dept.

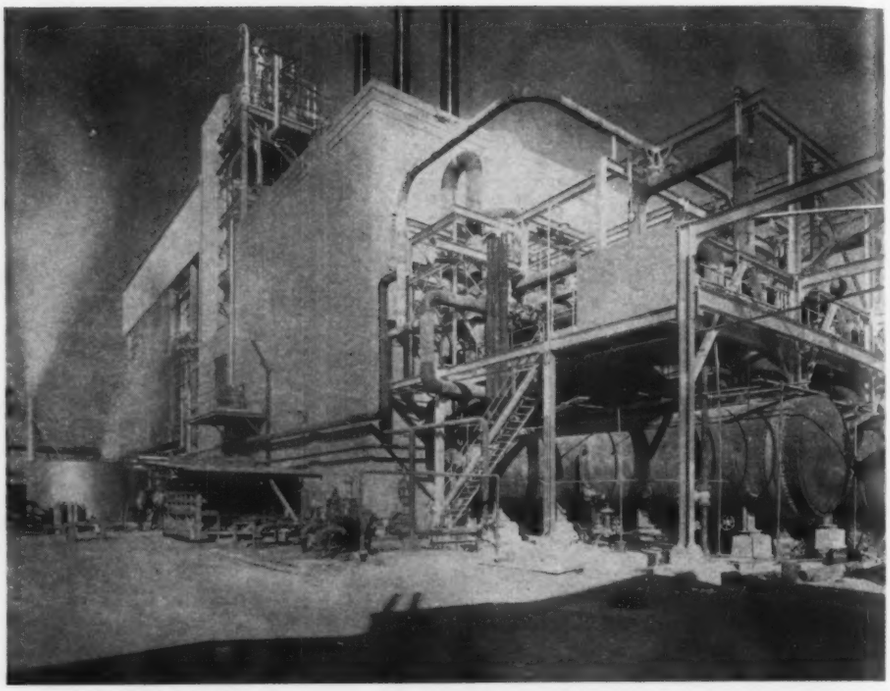
Approximately $20,000 was expended for replacements alone, and $58,000 for the extension and enlargement of plant. During the coming year approximately the same amounts will be expended for extensions and new capital.

The largest single project was the installation of almost one mile of underground distribution circuits in the business district, totaling $25,000. Approximately two miles of distribution lines were extended for new business.

There are no major improvements budgeted for 1941 except replacements and extensions. It is expected growth of March Field and the added personnel to the new Anti-Aircraft Firing Center near Riverside, that the general business of the city's electric light department will be increased to a large extent, and it is expected that one year from now a fairly large increase in domestic and commercial sales can be reported.—*R. L. Boulden, superintendent.*

San Diego G&E

During 1940 the San Diego Gas & Electric Co. invested $2,200,000 in new or improved facilities, of which amount $1,800,000 was expended in the electric department. The 1941 budget contemplates the expenditure of $1,943,000, of which amount $1,600,000 will be for the improvement of the electric system. These amounts cover only the expenditures for projects which will be completed in 1941. The budget provides $3,300,000 additional for projects to be carried over into 1942.



AVON PLANT, completed near year's end, was the first of PG and E's three 35,000-kw. steam plants at oil refineries. The other two will be ready this year

The most important addition to the company's system during the year 1940 was a new interconnection with the Southern California Edison Co., involving the construction by the San Diego company of 65 miles, and by the Edison company of 35 miles, of 132-kv. transmission line, extending from Chino to Mission Substation just outside of San Diego. This substation has a capacity of 36,000 kva., stepping from 132 to 66 kv., and tying into the San Diego system at the latter voltage.

A number of other substations were increased in size during the year. Some 160 miles of transmission and distribution circuits were installed, and the net gain in electric meters totaled 6,230.

In 1941 the company's major problem will be that of meeting the rapidly growing demands of military and naval authorities, and the aircraft industry, all of which are expanding notably in this territory. This not only involves the loads of naval stations, cantonments, and factories, but likewise miscellaneous domestic and commercial services for the rapidly increasing civilian population resulting from the defense program.

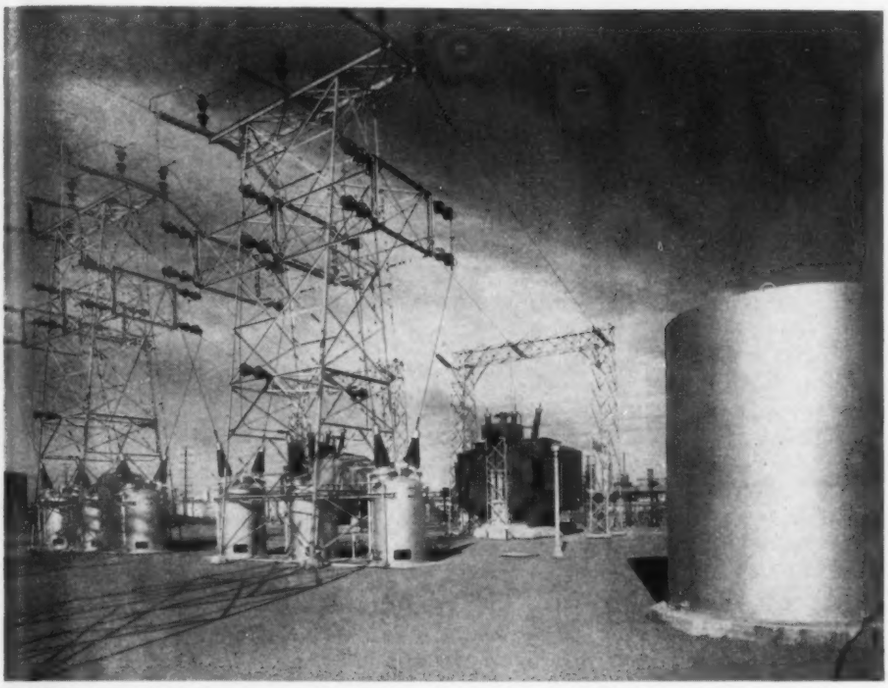
To bring Station B to its ultimate capacity, a 3,000-kw. house turbine is now being installed, and also a 200,000 lb. per hr. boiler. Heretofore the ultimate station capacity has been limited by boilers rather than turbines. These new installations will bring the station to its ultimate capacity of 102,000 kw. At the same time, to provide for the loads which the community growth will ultimately involve, the company is embarking on the first unit of a new steam generating station, to be known as Silver Gate, located at the foot of Sampson St. in San Diego. The first turbo-generator will be a 35,000 kw., 3,600 RPM hydrogen-cooled General Electric machine, built for 850 lb. pressure and 900 deg. F. There will be two Babcock & Wilcox boilers, each rated at 266,000 lb. of steam per hour. The new plant is scheduled to go into operation September 15, 1942.

Other major improvements contemplated for this year will be a new 3,750-kva., 12/4-kv. substation, to be known as Harbor Substation, which will provide for the water-front load. A new 6,000-kva. transformer is to be installed at Escondido Substation.

It is believed that community growth and the new military and defense projects will involve the building of 110 miles of transmission and distribution lines during the year, and that the net gain in electric customers will approximate 12,000.—*L. M. Klauber, vice-president in charge of operation.*

Southern California Edison

Our company spent approximately $5,000,000 for transmission lines, substations, distribution lines and equipment, and general system betterments during 1940. Our budget for 1941 contemplates an expenditure of approximately the same amount of money.



OUTPUT of Avon and other plants will go partly to oil refinery, balance to system. For details see report of PG and E construction activities on page 47

During 1940 a 115-kv. transmission line was constructed and put in service between Edison company's Chino Substation and San Diego, the Edison company constructing the line between Chino and Capistrano and the San Diego company from Capistrano to San Diego. This line was designed to transmit approximately 37,000 kw. of 60-cycle energy. A frequency changer is being installed at Chino, using the present synchronous condenser as a motor and adding a 60-cycle generator. This will have a capacity of 50,000 kw. The frequency changer will not be ready for operation until about June, 1941. Temporary energy is being supplied to San Diego by using the Nevada-California Electric Corp's Seal Beach-San Bernardino line, which has been connected into the Edison company's Chino substation, and Boulder power is being delivered by the Bureau of Power & Light to this line through the Bureau's Seal Beach steam plant.

No additional generating capacity was added to the Edison system during 1940. A total of 82,500 kva. of transformer capacity was added, about one-half of which was installed at Chino for the above interconnection. Thirty-five miles of high voltage transmission lines were constructed and approximately 100 miles of distribution lines added.

In addition to the thirty-five miles of transmission lines mentioned above, work was started on the second 220-kv. line from Boulder in the early summer of 1940. A 220-kv. cross-over station is being constructed at Pisgah, which is midway between Boulder and Chino and divides the transmission lines into four sections.

A new 220-kv. transmission line is planned from Chino to Laguna Bell and another 220-kv. line from Barre to Lighthipe. These 220-kv. lines will total approximately 285 miles.

It is expected that all of this work will be completed and ready for service in the early part of 1942 when the third 82,500-kva. generator at the Boulder Power Plant will be ready for operation.

A 50,000-kva. synchronous condenser was added to the Barre Substation this year and a 15,000-kva. synchronous condenser installed at Chino on the 60-cycle system.

Approximately 29,000 new meters were added in 1940 and the connected load was increased by approximately 135.000 hp.

Work has been started on the Piedra Substation which will interconnect the Pacific Gas and Electric's 110-kv. system with the Edison 220-kv. system. Transformer capacity for this interconnection will be 100,000 kva., in two banks. PG and E is building the substation and transmission lines and Edison is furnishing the transformers and metering equipment.

It is expected that the present growth trend will continue through 1941 and that our increase in customers and load will be approximately the same as for 1940. There is considerable activity in the airplane and shipbuilding industries in southern California, which has added new industrial load and increased the home-building activity. There are several new installations in prospect so that we expect 1941 to be as active as 1940.

In connection with the airplane and shipbuilding activities many small industrial plants supplying incidental equipment for these major construction activities have been established throughout the territory. This activity, together with the new homes being built, is quite uniformly distributed over the entire area and will require the reinforcement of distribution substations and feeders in many locations.

One of the outstanding features of this period is the interconnections which have been established between the various operating utilities. By the end of 1941, practically all of the utilities in this area will be interconnected so that energy can be transferred from one system to another, as conditions may require.—*N. B. Hinson, chief engineer.*

Turlock Irrigation Dist.

In 1940 the expenditure for the new construction amounted to approximately $50,000. In 1941 approximately $53,000 is proposed.

The 1940 program covered a small amount of new equipment needed at the power plants, and about 12 miles of additions to the distribution lines, together with a new regulator for a rural section of line.

A total of 299 new meters were added during the year, corresponding to a growth of 3½ per cent.—*L. H. Parker, electrical engineer.*

Colorado

Big Thompson Project, USBR

The purpose of the Colorado-Big Thompson Project is to divert water from the Western slope of the Continental Divide to provide additional water for 615,000 acres of land now under irrigation in northeastern Colorado. Several dams and power plants will be required on both sides of the Divide and a tunnel 69,023 ft. long for diverting the water to the eastern slope will be included.

Green Mountain Dam and power plant, located on the Blue River about 16 mi. south of Kremmling, the first unit of the project, is now under construction. This dam is being built to provide storage for the protection of

western slope lands during short-water years and still permit diversion to the eastern slope. The dam will be an earth and rockfill structure with a maximum height of 270 ft., crest length 1,200 ft., and a volume of 4,450,000 cu. yd.

Green Mountain power plant will be completed in 1942. The installation consists of two 12,000-kva. generators.

Seventy miles of 115-kv. transmission line were constructed and placed in operation in 1940. Porter J. Preston is supervising engineer, R. B. Ward is acting construction engineer on Green Mountain Dam.

Colorado Central Power

During 1940, this company expended approximately $48,000 for new and improved facilities. Our budget for 1941 contemplates $56,200. Both amounts represent capital expenditures only.

In 1940 we replaced our wooden Englewood substation with a modern steel structure. In conjunction with this, we started on a program of phase area improvement which will extend over the next five years and which will greatly increase our quality of service.

We have increased the capacity of our substation transformers by about 1,500 kva. The year required the addition of 28 mi. of primary and secondary distribution. Since we purchase all power used, we have no true transmission lines and all lines of 6.9 kv. and over are actually rural distribution in character. We added a net of 513 customers—practically all domestic—which increased our peak connected load 497 kw. For the first time the 4,000-volt-Y construction was applied in small districts. This will no doubt be extended.

During 1941 we expect to continue our phase area improvements and our increases in conductor and transformer capacities. The capacity of our substations will be increased 1,500 to 2,000 kva.

The extension of primary and secondary lines will no doubt equal or exceed that of 1940. We anticipate increases of at least 500 customers and most of these will be domestic. This addition will probably increase our peak load by approximately 500 kw.—*R. N. Earll, assistant secretary and assistant treasurer.*

Colorado Springs PU Dept.

In 1940 we spent about $95,000 on improvements to our electric system which went largely to the distribution and transmission departments for such items as meter replacement, transformer capacity increases, small extensions and sectionalizing feeders with pole top reclosing switches. For 1941 we have budgeted $230,000. In addition to a continuation of the general improvement program, this will provide a new boiler at our steam plant as the first step in increasing our generating capacity—*F. H. Wiley, superintendent, electric division.*

Public Service of Colorado

New construction in 1940 totaled approximately $1,806,500. In the electric department this included extensions, rebuilds, and betterments to substations, transmission and distribution lines, steam and hydro plants, and the start of enlargement at Valmont Plant.

Construction expenditures anticipated for 1941 will exceed those for the previous year by a substantial margin. Included in the proposed expenditures will be additions to the Valmont Plant, the company's largest steam generating station, which will bring the total generating capacity to 95,000 kw. This construction program is expected to require an expenditure of about $2,500,000. A new 25,000-kw. generator will be installed and additions will be made to the plant building. Other equipment to be added includes new boiler, switchboard, transformer capacity, and auxiliary equipment.

In the transmission department a major job of re-conductoring was completed in 1940 on a section of the 100-kv. transmission line in the rugged Continental Divide region between Leadville and Sellers. Improvements were made to the hydro plant at Georgetown and to the water gravity line above the plant. At the Sterling Plant work was commenced on rebuilding the switchboard. At West Station in Denver the switching apparatus was rebuilt and transformer capacity was increased at the Terminal. The substation at Alamosa was enlarged. Numerous line extensions were made throughout the territory served, including an important line to the emergency landing field of Denver's air school at Lowry Field, and another in the placer mining district near Fairplay to provide electric service for a dredging operation.

Satisfactory load growth was experienced in 1940 as is indicated by an increase in kilowatt-hour sales of approximately 10 per cent over 1939. A continuing upward trend for kilowatt-hour sales is indicated for 1941.—*Guy W. Faller, president and general manager.*

Southern Colorado Power

Our construction budget for 1940, after revision for generation was $1,042,000 and for 1941 it is $822,600, which includes $506,000 carryover from 1940 generation. The expenditures for 1940 by items were as follows:

Generation	$850,000
Buildings	25,000
Transmission	13,000
Substations	27,000
Distribution	118,000
Street railway	4,000
Automotive transportation	5,000

The major item under generation was for a 7,500-kw. addition to the Pueblo steam plant, including a 50-ft. by 124-ft. building, one 90,000-lb. boiler, 400-lb. pressure, and one 7,500-kw. turbo-generator. As of January 1, 1941, this addition was 35 per cent completed and the estimated date for placing in service is June 15, 1941.

All other items are normal for our property. The 1941 construction budget is itemized as follows:

Generation	$587,080
Buildings	7,650
Transmission	21,400
Substations	39,000
Distribution	141,770
Street railway	20,300
Automotive transportation	5,400

A six-mile drainage tunnel being constructed 1,000 ft. lower than the deepest mines in the famous Cripple Creek gold mining district will be completed in April, 1941. This will greatly prolong the life of this mining district, which is located on Pikes Peak about 90 miles by automobile from Pueblo and served by this company.—*M. G. Lord, vice-president in charge of operation.*

Trinidad Electric

We have made no substantial expenditure for either new generating or distributing equipment during 1940. The community served by us is largely a coal mining district and the condition of the coal mining business at present does not justify any large expenditures. We have budgeted for 1941 no money for new or additional generating or distributing capacity. However, we have set up $10,000 for the construction of approximately ten miles of rural distribution lines.

In line with the present defense program, we do not believe that it will be necessary for us to spend a very substantial sum, as it is our policy to maintain our equipment in first-class operating condition at all times, and the coal mines which we serve will be able to handle additional orders without large additions to their present equipment.—*R. T. Armstrong, power production superintendent.*

Idaho

Idaho Power

Approximately $1,960,000 was spent for construction of facilities in 1940. This exceeds last year's original estimate by approximately $660,000. For 1941 our estimated construction is

about $1.250,000. The new 6,000-kva. substation at Nampa, the new 3,000-kva. substation at Boise and the attendant reconstruction of transmission and feeder lines contemplated for 1940 were postponed.

1940 Program

The 44-kv. Thousand Springs - Jarbidge-Mountain City transmission line was converted to 66-kv. operation, and an automatic reclosing 66-kv. line sectionalizing oil circuit breaker was installed at Jarbidge. A 44-kv. transmission line 17 miles long was constructed north from Shoshone City to connect with a new line of West Coast Power Co. This line will provide duplicate service to the Hailey-Sun Valley territory. An automatic reclosing oil circuit breaker was installed on this new line at the Shoshone City substation.

corporate city limits. Customers gained during 1940 were 4,431.

Program for 1941

Completion of the Idaho Power section of the Anaconda-Grace 161-kv. line, and of the cutover to 12 kv. of the Payette distribution system will be effected early in the year.

It is planned to install feeder regulators in Bruneau, Hagerman, Wendell, Midway, Boise and Pocatello, due either to installation of new feeders or to correct voltage on old ones. Regulator capacity at Weiser is to be increased. Substation transformer capacity increases are planned at Boise (4,150 kva.), Indian Cove (90 kva.), Midway (1,750 kva.), Aberdeen (400 kva.), Blackfoot (1,000 kva.), Pocatello (3,750 kva.) and Inkom (40 kva.). A 10 per cent booster transformer is planned at Ontario in the Ontario-

1941 we are planning to spend $1,400,-000. The largest item in both cases is for transmission facilities.

In 1940 a 100-kv. transmission line was completed from Harlowton to Billings to increase the transmission capacity to Billings from the Great Falls Plants.

In October, construction of a 161-kv. line was started to extend from Anaconda south to the Idaho state line, a distance of 126 mi. This line will connect to lines of similar construction by Idaho Power Co. and Utah Power & Light Co. which, together, will establish a connection between Anaconda, Montana and Grace, Idaho and tie together the systems of the three respective companies. This line is of wood pole construction with 250,000 c.m. hollow conductor.

Connection to the Montana system at Anaconda will be made through a 50,-

Current and Future Power Development on Bureau of Reclamation Projects

Name of Project	State	River	Purpose (1)	Name of Plant	Year Initial Operation	Initial Capacity Kw.	Initial Capacity No. of Units	Ultimate Capacity Kw.	Ultimate Capacity No. of Units
Boulder Canyon	Ariz.-Nevada	Colorado	F. C., Irr., P.	Boulder	1936	704,800 (2)	11 (3)	1,322,300	19 (4)
Columbia Basin	Washington	Columbia	F. C., Irr., P.	Grand Coulee	1941	344,000	5 (5)	1,974,000	21 (6)
Central Valley	California	Sacramento	F. C., Irr., P.	Shasta	1942	304,000	4 (7)	379,000	5 (8)
Kendrick	Wyoming	Platte	F. C., Irr., P.	Seminoe	1939	32,400	3 (9)	32,400	3 (9)
Rio Grande	New Mexico	Rio Grande	Irr., P.	Elephant Butte	1940	24,300	3 (10)	24,300	3 (10)
Colo.-Big Thompson	Colorado	Blue	Irr., P.	Green Mountain	1942	21,600	2 (11)	21,600	2 (11)
Colo.-Big Thompson	Colorado	Big Thompson	Irr., P.	1, 2, 3, 4, and 4A	(12)	(12)	(12)	105,000	(12)
Parker	Ariz.-Calif.	Colorado	W. S., Irr., P.	Parker	1942	90,000	3 (13)	120,000	4 (14)

(1) F. C. = Flood Control; Irr. = Irrigation; P. = Power, W.S. = Water Supply.
(2) As of January 1, 1941.
(3) 8 - 82,500 kw; 1 - 40,000; and 2 - 2,400 kw.
(4) 15 - 82,500 kw; 2 - 40,000; and 2 - 2,400 kw.
(5) 3 - 108,000 kw; 2 - 12,500 kva. at 0.8 p.f.
(6) 18 - 108,000 kw; 3 - 12,500 kva. at 0.8 p.f.
(7) 4 - 75,000 kw; 2 - 2,500 kva. at 0.8 p.f.
(8) 5 - 75,000 kw; 2 - 2,500 kva. at 0.8 p.f.
(9) 3 - 12,000 kva. at 0.9 p.f.
(10) 3 - 9,000 kva. at 0.9 p.f.
(11) 2 - 12,000 kva. at 0.9 p.f.
(12) 5 plants installed in approximately 1944 to 1965.
(13) 3 - 30,000 kw.
(14) 4 - 30,000 kw.

Interconnection of all major Northwest power systems was brought closer with the construction of the new 161-kv., 277-mile Anaconda-Grace transmission line, scheduled for completion soon after February 1, 1941.

No work of importance was done at generating stations during 1940.

Improvements at substations have consisted mainly in increasing feeder switch capacities at Boise, Twin Falls and Pocatello. At Nampa a temporary feeder was installed until the new substation can be built. A 100-kva. transformer bank was added to the Shoshone City substation supplying rural feeders and the Dietrich area. The Dietrich substation was removed.

About 60 miles of 2,300 and 4,000-volt distribution lines have been cut to 12 kv. This work includes modernization of some of the Payette distribution system. Seven hundred twenty c-kva. of condensers have been installed.

Approximately 600 miles of rural distribution lines were added; about 20 miles of new lines were added within

Emmett 66-kv. line. New feeders are planned for Boise (12 kv.), Indian Cove (2,300 kv.) and Pocatello (12 kv.) Feeder cutovers are scheduled for Boise, Nampa and Pocatello, to 12 kv., totaling about 115 miles.

We expect to build about 230 miles of rural distribution during 1941. Certain distribution and street lighting systems are scheduled for reconstruction and modernization.—*Henry L. Sanger, chief engineer.*

Minidoka Project, USBR

One additional 6,000-kva. generating unit was under construction in the Minidoka power plant during 1940 and work will be completed in 1941. Power from this unit will be used for irrigation pumping purposes. Stanley R. Marean is superintendent.

Montana

Montana Power

In 1940 we expended approximately $1,600,000 on electrical construction. In

000-kw. auto transformer substation connecting to the 100-kv. system at Anaconda.—*H. H. Cochrane, chief engineer.*

Nevada

Boulder Project, USBR

The present installed generating capacity at the Boulder power plant is 704,800 kw. During 1941 two additional 82,500-kw. generators will be completed and the installation of one of them will be in progress. Energy production is at the rate of approximately 340,000,000 kw.-hr. per month. Additional transformer capacity for the increased load of the State of Nevada will be installed early in 1941. Irving C. Harris is director of power.

Sierra Pacific Power

Expenditures during 1940 for new facilities in the electric department amounted to $190,000. The 1941 budget contemplates spending of about $350,-

COLGATE TUNNEL, 4½-mi. bore for Colgate Plant on Yuba River, PG & E; a $1,400,000 job, holed through last year, replacing wood flume, improving efficiency

000, the increase being due principally to inclusion of several items postponed last year because of abnormal requirements in the water department.

During 1940 line transformer capacity was increased by approximately 1,400 kva. or about 4½ per cent; miles of line in voltage classification above 6,600 were increased by 31; the net increase in the lower voltages was insignificant. Number of meters in service was increased by 932, or 6½ per cent.

Among the items proposed for 1941 are: modernization of the Reno street lighting system on several of the principal streets; installation of additional Diesel generating capacity at Battle Mountain; a 1,000-kva., 60-kv. step-type voltage regulator to improve regulation on a long line serving large mining loads in the Lovelock area; a new outdoor substation of 1,000-kva. capacity at Yerington; construction of 14 miles of 60-kv. line from Carson City to Lake Tahoe, including a 3,000-kva. substation at Glenbrook; reconstruction of forebay at the Washoe hydro plant; and replacement of several waterwheel runners.

The only increase in generating capacity will be 125 kw. at Battle Mountain. The increase in line transformer capacity should be comparable with 1940. Transmission lines specifically provided for include 25 miles of 60-kv. and 4 miles of 24-kv.

It is expected that increases in residential and commercial loads and customers will be about the same as last year.—*V. D. Armstrong, engineer.*

New Mexico

Albuquerque G&E

During 1940 we spent $165,000 in the electric department for capital expenditures. For 1941 we have budgeted $160,000 for this purpose. These amounts seem to be approximately what it requires to maintain on a year to year basis the increase on our property.

We added no generating capacity, but did add about 5,000 kva. in transmission transformer capacity and about 2,200 kva. in distribution transformer capacity. We also constructed about five miles of 44-kv. line, two miles of 22-kv. line and about 25 miles of distribution lines. Our net increase in meters is approximately 1,500.

During 1941 we will not expand our generating capacity at all, but we expect to add a 1,000-kva. substation to take care of a new army air base being built at Albuquerque, and about 2,500 kva. in distribution transformers on our system.

Due to the continued growth of Albuquerque, we expect to add in 1941 about 1,500 meters. In addition to the above, we expect to serve 250 miles of rural line to be built under a Federal REA project.—*Arthur Prager, president and general manager.*

Rio Grande Project, USBR

The installation of three 9,000-kva. generating units at the Elephant Butte power plant was completed in 1940. Power delivery to the New Mexico Public Service Co. at Hot Springs, N. M., was begun in November, and delivery to the El Paso Electric Co., at Las Cruces, N. M., was begun in December.

Construction of 63 miles of 115-kv. transmission line between the Elephant Butte power plant and the town of Las Cruces, New Mexico, was completed in 1940.

During 1941 there will be constructed 117 mi. of 115-kv. transmission lines between the Elephant Butte power plant, Deming, and Central City, N. M., and substations at Deming and Central City. Delivery of power will begin upon completion of these lines and substations. L. R. Fiock is superintendent.

Oregon

Bonneville

Funds for construction and operations are provided by congressional appropriations and are therefore based upon the regular Federal fiscal year ending June 30. The appropriation for the 1940 fiscal year was $13,000,000 and $9,850,000 has been appropriated for the 1941 fiscal year.

1940 Program

Major substations have been placed in service at Vancouver, North Bonneville, and St. Johns with a total transformer capacity of 105,000 kva. In addition, transformer installations in substations devoted to the service of a single customer or of minor nature totaled 119,000 kva. Work has been in progress on major substations at Vancouver, Chehalis, Covington, Midway, St. Johns, and Salem, with a total transformer capacity of 335,000 kva. in addition to that now in operation.

During the past year three major 230-kv. lines with a combined length of over 300 miles were completed. The largest of these was the Bonneville-Grand Coulee line of 234 miles. In addition to the 230-kv. lines, 54 miles of 115-kv. lines and 45 miles of 69-kv. and lower voltage were completed.

1941 Program

During 1941 it is expected that three units of 108,000 kw. each will be installed and placed in operation at the Grand Coulee plant, and installation work will be in progress on two units of 54,000 kw. each at Bonneville.

The substation construction program calls for the completion of the 335,000 kva. of transformer installations in major substations now under construction, and in addition work is now in progress or authorizations have been

obtained for a number of minor substations totaling 177,500 kva.

The transmission line construction program as now authorized calls for the completion of 250 miles of 230-kv. lines and 375 miles of 115-kv. lines.

Work is nearly completed on a 35,000-kva. synchronous condenser at Vancouver substation, which is expected to be in service early in 1941. At Salem there is to be installed during 1941 a 20,000-kva. synchronous condenser.—*S. E. Schultz, chief engineer.*

Bonneville Dam, U. S. Army

A total of $4,951,000 was spent during 1940 for additions to the building and installation of generating equipment in the powerhouse at Bonneville Dam. A similar amount will be spent during 1941, pointing toward completing the 10-unit powerhouse in 1944.

Work on the powerhouse extension will be pushed energetically on a 3-shift basis during 1941, but completion of the structure is scheduled for late in 1942. The contract has been awarded for four additional 74,000-hp. turbines and governors, and it is expected that a contract will be awarded early in the year for four additional 60,000-kva. generators.

Generators 5 and 6 will be completed and put into service in the fall of 1941. Both of these generators will be connected to one bank system of three single-phase, 40,000-kva. transformers which will step up the energy for transmission at 230 kv. These three transformers, weighing 145 tons each when completely assembled, cost $237,000.—*C. R. Moore, Lt. Col., Corps of Engineers, district engineer.*

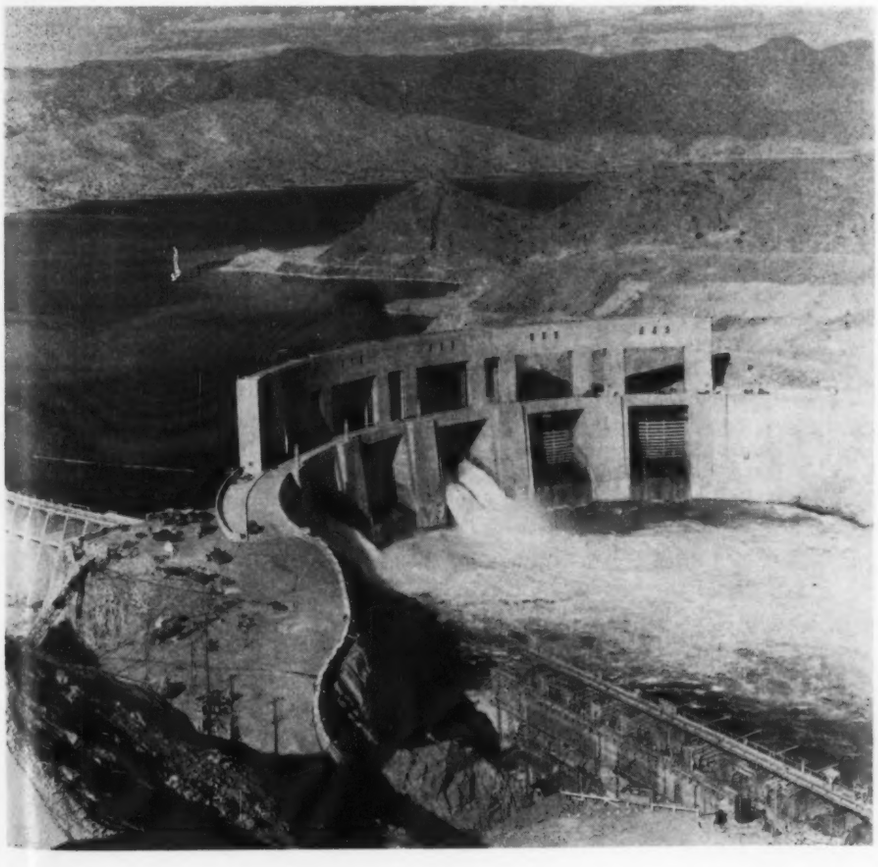
California Oregon Power

This company has approved a construction budget for 1941 amounting to $1,212,000, which is about the same as the budget for 1940. About half of this amount covers anticipated new business.

During the past year the company has added 92 miles of new transmission line, 235 miles of distribution line, increased its connected load by 28,500 kw., and added 4,392 meters.

During 1941 the major expenditures will be for rebuilds, additions and betterments to the existing system to take care of added customers. There will be no additional capacity installed in the company's generating plants. There will, however, be additions to transmission lines and substations amounting to about $350,000. There will also be an increase in the capacity of distribution lines and facilities amounting to about $250,000.—*J. C. Boyle, vice-president in charge of operation.*

PARKER DAM power will eventually go as far as Tucson. The Bureau of Reclamation has three 30,000-kva. units scheduled for service early in 1942



Eastern Oregon L&P

Our system improvements during 1940 approximated $77,000. For the year 1941 we have budgeted $74,000. In December, 1940, at the Baker Substation, we added a 1,000-kva. type C.S.P. unit substation. This is a 66/4-kv. unit, and the first to be installed in the Northwest, with a primary voltage in excess of 13 kv.

During the year we added approximately 13 miles of rural line. We gained a total of 69 meters on the system, and now have connected 8,670 meters. The gain in the total kw.-hr. sold to residential customers in 1940, over 1939, is 19.6 per cent, which establishes a record.

The fact that Union County voted for a PUD, that Baker County is now considering this way of life, and that the Bonneville Administration is studying the possibility of acquiring the property in order to later sell parcels to PUD's, naturally has affected the 1940 construction expenditures, and the program of construction expected for 1941.—*O. D. Lanning, chief engineer.*

Eugene Water Board

In 1940 our fixed capital additions were approximately $193,650. For 1941, $740.227 has been budgeted. Of this, $240.227 is for improvements and additions to the transmission and distribution system, and present generating units, and $500,000 for the completion (total estimated cost $550.000) of an addition to the present steam plant. The building to house the new steam unit is well under way, and soon after the first of the year equipment will begin to arrive for installation. The principal units are a Westinghouse 7,500-kw. turbo-generator and condenser, and a Babcock and Wilcox boiler to be equipped for burning both oil and hogged fuel.

Last year customers increased 7.7 per cent, and total kilowatt-hours increased approximately 21.9 per cent. The estimated kilowatt-hours per residential customer for 1940 is 2,550. Range saturation is 49.5 per cent.—*J. W. McArthur, general superintendent-secretary.*

Mountain States Power

During 1940 this company expended approximately $850,000 for new and improved facilities, the greater portion

of which was for the extension of rural distribution lines. Approximately 3,700 new electric customers and 500 new customers for other utility services were connected. Additional distribution facilities which have been added to take care of the increased customers have necessitated the construction of approximately 225 miles of line.

During 1941 it is anticipated that the company will expend approximately $750,000 on capital additions and betterments. These will include continued expansion of rural distribution facilities and an additional unit of 2,500-kw. to be installed at Dallas, Ore., preliminary work for which is already under way.

Northwestern Electric

This company spent approximately $415,000 for property additions in 1940, which includes the purchase price of the Western Light & Power Co. in the Camas-Washougal territory. The money to be spent in new and improved facilities in 1941 will be approximately $435,400.

In 1940 2,750 kva. of transformer capacity was added and 115 miles of distribution lines, which includes 55 miles purchased from Western Light & Power. No generating capacity was added and no transmission line was built. In 1940 2,900 customers were added to the system which includes 1,100 customers on the purchased system of the Western Light & Power. Connected load added was 22,100 kw.

It is proposed to rebuild our Condit-Camas 66-kv. transmission line over a five-year period at a total estimated cost of $157,000. One-fifth of the line will be replaced in 1941.

We have budgeted in 1941 an expenditure of $62,100 to cover the cost of a new 66-kv. substation located in the St. Johns district of Portland, which is a manufacturing district now served by long 11-kv. lines. This figure includes expenditure necessary for approximately three miles of 11-kv. line to connect up new manufacturing plants.

The estimated transformer capacity to be added in 1941 is 11,000 kva. and the estimated distribution line thirty miles. No additional transmission line or generator capacity proposed. The estimated increase in connected load for 1941 is 27,500 kw. and estimated new customers 1,650.—*O. L. LeFever, general superintendent.*

Pacific Power and Light

Pacific company spent for construction during 1940 approximately $1,027,000. The amount estimated for similar work during 1941 is $629,500. Generating equipment installed at Bend, Ore., and increased mileage of rural extensions required in 1940 accounts for the larger part of the difference.

During 1940 Pacific company purchased the electric system of the Knappa-Svensen Electric Co., serving a rural area immediately east of Astoria, and the electric system of the Hermiston Power and Light Co., serving the communities of Hermiston, Umatilla, Echo, and Stanfield in the western part of Umatilla County.

A 3,000-kw. steam turbine with auxiliaries and control equipment was installed at Bend to meet growing load demands on the Deschutes system. The total spent for generating equipment for the year 1940 was $102,000. Three 2,000-kva. transformers were installed at Pendleton to supply capacity for load growth. Transformer capacity at several other locations was increased because of growing load but required no new units.

Exact mileage of rural lines built during 1940 is not yet available but will approximate 110 miles. A total of $700,000 was spent on distribution equipment.

Construction for 1941 will be mainly for distribution plant. No additional generating equipment or extension of existing transmission lines are contemplated. Provision has been made for a physical connection with the Bonneville transmission system at Astoria, Ore., where power will be purchased under contract for distribution to customers.

It is planned to purchase three 1,500-kva. transformers for Walla Walla substation because of load growth. Transformer replacements will be required at several other locations, but transformers on hand will be used. Fifty miles of rural distribution line are estimated to be built in 1941 and are included in the total of $325,000 budgeted for extensions of service to new customers. Strengthening of distribution facilities and improving existing service conditions will require an additional $170,000.

The territory served by Pacific company is largely devoted to agriculture and stock-raising. Industrial activity is directly responsible for about 15 per cent of the company's gross revenue. As a result, participation in the national defense program will not be as direct as in areas more highly industrialized. The national defense program will, however, require lumber, food, wool and other products produced or grown in our territory. General business conditions are expected to be good through 1941.—*H. H. Schoolfield, general superintendent.*

BONNEVILLE SUBSTATIONS

Name or Location	Transformer KVA.	Arrangement	Voltages	
Vancouver	75,000	Star-Star	220-115	*
Vancouver	75,000	Star-Star	220-115	‡
North Bonneville Switching Station			220	(b)
Midway	50,000	Star-Star	220-115	‡
St. Johns	30,000	Star-Star	110- 57.1	*
St. Johns	30,000	Star-Star	110- 57.1	‡
Salem	30,000	Star-Star	110- 57.1	‡
Salem	1,000	Star-Star	57.1- 12.5	*
Eugene	12,000	Star-Delta	110- 11.5	*
Raymond	12,000	Star-Delta	110-66/22	*
Raymond	3,000	Delta-Delta	66/22-34.5	*
Ellensburg	3,000	Star-Delta	110- 6.9	‡
Albany	1,000	Star-Star	110- 12.5	*
Chehalis	75,000	Star-Star	220-115	‡
Chehalis	12,000	Star-Delta	110-66	*
The Dalles	1,000	Star-Star	110- 12.5	‡
Astoria	12,000	Star-Delta	110- 23	‡
Covington	75,000	Star-Star	220-115	‡
Alcoa	75,000	Delta-Star	110- 13.8	*
Alcoa	150,000	Delta-Star	110- 13.8	‡
Walla Walla	7,500	Star-Delta	110- 69	A
Walla Walla	1,000	Delta-Star	69- 12.5	A
Lewiston	1,000	Star-Star	110- 12.5	A
Colfax	1,000	Star-Star	110- 12.5	A
Pendleton	1,000	Delta-Star	66- 12.5	A
McMinnville	3,000	Delta-Delta	66- 2.4	*

* Completed. ‡ Under Construction. A Authorized. (b) Part in Operation.

Portland General Electric

In common with other utilities of the Northwest, this company is planning for complete cooperation with the Bonneville project. For this reason the annual construction budget makes no provision for additional generating facilities for 1941, since base blocks of increasing magnitude will be contracted with the Bonneville Administration from time to time. The 1940 load for the company was 835,863,000 kw.-hr., with a maximum one-hour peak of 184,000 kw.

In lining up the construction program for the ensuing year provisions are made for handling an increase of eight per cent in demand requirements. A comparison of the 1940 and 1941

budget figures are given below:

Expenditures for	1940	1941
Steam power stations	$ 5,000	$ 5,000
Hydro power stations	123,000	107,000
Transmission lines	128,600	99,900
Substations	468,300	302,800
Distribution system	787,200	1,062,600
Miscellaneous	42,700	60,700
Total new construction	$1,554,800	$1,638,000
Maintenance	616,432	674,000
Total maintenance and construction	$2,171,232	$2,312,000

It will be noted that the preponderance of the expenditures covers additions to the distribution system and distribution substations.—*Walter Brenton, chief engineer.*

West Coast Power

This company's construction for 1940 consisted largely of increasing capacities of existing substations and constructing one transmission line and necessary substation for an interconnection with another utility. Double facilities were also provided to one community. The estimated total expenditure for 1940 for construction was $250,000 and approximately $225,000 will be budgeted for 1941.

One new substation was installed and capacities of three others increased, the total being 3,000 kva. One new transmission line was constructed for an interconnection and a double transmission line over a different route was built, the two representing a total construction of 50 miles of line. It is estimated that approximately 150 miles of 6,900 and 11,000-volt distribution lines were constructed in 1940.

The increase of meters is estimated at 1,500 and the connected load is estimated to have increased by 500 kva.

There are no special programs scheduled for 1941. It is estimated that the generating capacity of the entire system will be increased by approximately 1,000 kva. and that transformer substation capacities will be increased by a similar amount. There are no special transmission line extensions contemplated but probably about 25 miles of new line will be constructed. It is estimated that approximately 100 miles of 6,900 and 11,000-volt distribution lines will be constructed.—*W. C. MacInnes, president.*

BONNEVILLE TRANSMISSION SYSTEM

From	To	Circuit Miles	Conductor	Const. Voltage	Initial Operation Voltage	
North Bonneville	Grand Coulee	233.7	795,000 cm ACSR	230	115	*
Vancouver	Kelso	41.2	795,000 cm ACSR	230	115	*
Kelso	Chehalis	30.1	795,000 cm ACSR	230	115	*
Chehalis	Raymond	45.5	250,000 cm cu	115	115	*
Chehalis	Covington	69	795,000 cm ACSR	230	115	‡
Bonneville	Hood River	22	250,000 cm cu	115	115	‡
Canal Crossing		0.6	795,000 cm ACSR	115	115	‡
Hood River	The Dalles	16.1	250,000 cm cu	115	115	‡
Vancouver	Alcoa	8.4 (X)	556,500 cm ACSR	115	115	*
Salem	McMinnville	21.7	3/0 ACSR	69	69	*
Chehalis	Centralia	11.4	1/0 ACSR	69	69	*
Salem	Monmouth	13	1/0 ACSR	12.5	12.5	*
Covington	Tacoma	13.1	397,500 cm ACSR	115	115	‡
Bonneville	North Bonneville	0.6	801,900 cm ACSR	230	230	*
Chehalis	Mossy Rock	24	No. 2 ACSR	69	69	‡
Midway	Ellensburg	68.3	250,000 cm cu	115	115	‡
St. Johns	Astoria	82.1	250,000 cm cu	115	115	‡
Covington	Seattle	11.2	795,000 cm ACSR	230	230	A
Midway	Walla Walla	86.6	250,000 cm cu	115	115	‡
Bonneville	Oregon City	51.2	350,000 cm cu	115	115	‡
Oregon City	Salem	34.2	250,000 cm cu	115	115	‡
Walla Walla	Lewiston	85	250,000 cm cu	115	115	A
Lewiston	Colfax	42	250,000 cm cu	115	115	A
Walla Walla	Pendleton	44	250,000 cm cu	69	69	A
Covington	Grand Coulee	183	500,000 cm cu eq	230	230	‡

* Completed. ‡ Under Construction. A Authorized. (X) Double Circuit.

Utah

Beaver Municipal

The City of Beaver has started construction on a new municipal hydro plant in Beaver Canyon, to replace its outdated unit. Cost: $600,000.

Utah Power & Light

Replacements and additions to plant in 1940 totalled $1,502,574, and those for 1941 are estimated at $1,551,500.

Outstanding items in the 1940 program were: the addition of 386 mi. of urban and rural line, distribution-substation capacity increases amounting to 4,600 kva., and the installation of 10,870 ckva. in static capacitors.

The larger items proposed for 1941 are: 57 mi. of 161-kv. transmission, now under construction; 45,000 kva. of transmission transformer capacity increase, now under construction; distribution substation capacity increase of 3,550 kva., and the addition of 320 mi. of rural and urban distribution line—*L. B. Fuller, chief engineer.*

Telluride Power

In 1940 we spent approximately $75,000 for new and improved facilities. Our 1941 budget should be about the same amount. The major improvements in 1940 were the reconstruction of a 30-ft. rock crib dam on the Beaver River, the installation of 1,500 ft. of 36-in. wood stave flowline and 1,100 ft. of 34-in. bypass flowline, approximately 15 miles of distribution lines to supply outlying rural areas, 1 mile of 44-kv. line and a 100-kva. substation.

Interest in metal mining is increasing in the area served, and it is anticipated that it will be necessary to extend some lines into the mining areas. It is likely, also, that approximately 20 miles of rural lines will be constructed and that a certain amount of enlargement and rehabilitation of distribution systems will be undertaken in 1941.—*Paul P. Ashworth, chief engineer and assistant general manager.*

Washington

Columbia Basin Project, USBR

Grand Coulee Dam was practically completed at the end of 1940, and the work remaining to be done will be finished during 1941.

Installation of three 108,000-kva. and two 12,500-kva. generating units in the left wing of the powerhouse was started in 1940 and work will continue during 1941. F. A. Banks is supervising engineer and A. F. Darland is construction engineer.

Puget Sound Power & Light

During 1940 this company spent about $2,602,000 on construction work. It is estimated that the 1941 budget will be about $3,000,000 or one-third more than in 1940. The increase is due principally to proposed reconstruction work at the Electron Plant.

One of the most important projects in 1940, which is now practically completed, was the laying of about four miles of submarine cable across Puget Sound to increase the capacity of our facilities for supplying power to the Puget Sound Navy Yard. This cable has a capacity of 15,000 kva. and operates at 15 kv. Step-down transformer capacity totaling 15,500 kva. was required at the east shore of the crossing with an equal amount of step-up transformer capacity at the west shore. In addition, 31.52 miles of 55-kv. and 66-kv. transmission lines were constructed to duplicate the tie between the company's main system and the Navy Yard. Other additional facilities in 1940 included 35,000 kva. of transformer capacity and 155 miles of distribution lines. The number of customers increased by approximately

10,000 during the year. There were no additions to generating capacity.

Rehabilitation of two generating units and seven miles of flume at the Electron Plant in 1941 will increase generating capacity by 12,500 kw. Increases in transformer capacity will total about 45,000 kva. Twelve miles of new transmission lines are proposed and 150 miles of distribution lines.

phase to three-phase, and additional transformers installed to care for increasing load. Two switching stations in the 165-kv. Skagit transmission lines were rearranged and improved with additional equipment. For the use of employees at the Skagit camps 55 garages were constructed.

Three water-gaging stations on the upper Skagit River were built in new

containing rectifiers is being carried forward from 1940.

Reinsulation and partial reconstruction of Seattle's portion of the Seattle-Tacoma tie line—started late in 1940—will be completed in 1941, and will raise the voltage of this line from 60 to 110 kv. Plans have been prepared for an interconnection with the Bonneville-Grand Coulee transmission system,

SPEEDY BUILDING of interconnections was a year-end job for many Western systems. Here, machines aid manpower in hole digging for one of the ties, in southern California

PUGET SOUND P & L helped the defense program by laying a submarine cable to Navy yards in record time. Here is the cable in gondola-car train, as shipped from Okonite

The gain in number of customers in 1941 is expected to be about 10,000. It is estimated the total load will increase around 8 per cent.—*Frank McLaughlin, president.*

Seattle Dept. of Lighting

The construction budget for 1940 was about $1,000,000, exclusive of extensions to serve customers, which averages $45,000 per month. The budget for 1941 will be slightly in excess of $1,000,000, on account of increased industrial activity due to the preparedness program.

1940 Program

Installation of remote metering by carrier current from the substations to the load dispatcher's desk was completed. Several 26-kv. tie lines between the substations were enlarged, and in some cases rerouted, and additional relay protection was installed. The distribution circuits in a large section of the city were changed from two-

locations because of the lake formed behind Ross Dam. The first step in the construction of Ross Dam was completed in concrete to El. 1,365, with a 15-ft. temporary wood bulkhead, raising Ross Lake to El. 1,380, thus providing 100,000 acre-ft. of water storage. Considerable work was done in meeting the requirements of the Seattle transit system for direct current for trackless trolleys, and the completion of this work is being carried over into 1941.

1941 Program

The construction of two 6,000-kva. 26/4.3-kv. substations, and additional transformer capacity in other stations has been transferred to the 1941 budget. In addition, there is planned the construction of a substation of 18,000 kva. transformer capacity, 26/4.3-kv., to feed the underground network in the city's business district. The installation of mercury-arc rectifier equipment in two attended substations, and the construction of three non-attended stations

but the start of construction is undecided at present.

It is estimated that increased industrial activity caused by the preparedness program will require some 5,000 kva. in additional distribution transformers, as well as enlarged feeder capacity. The new "all electric" rate, inaugurated in 1940, is resulting in a rapid increase in the installation of electric ranges and water heaters, which will require increased distribution facilities in the residential districts of the city.—*E. R. Hoffman, superintendent of lighting.*

Tacoma Dept. of Public Utilities

Our expenditures for improvements and new construction during 1941 will quite likely be about as follows:

Steam power stations	$5,000.00
Hydro power stations	50,000.00
Transmission lines	200,000.00
Substations	100,000.00
Distribution	200,000.00
Miscellaneous	301,500.00
Total	$856,500.00

Tacoma's new 110-kv. Tideflats Substation, which will serve as a terminus for the Bonneville-Coulee and Seattle interconnections, will be completed in February, 1941. Separate governmental lines from Bonneville and Coulee are scheduled for early completion into the Puget Sound area. The existing 50-kv. Seattle-Tacoma intertie will be reinsulated early in 1941 for 110 kv. and the capacity increased to 60,000 kw. One new 3.000-kva. and one new 4,500-kva. distribution substation will be constructed in the Hillcrest and South Tacoma districts. The Grove Street and Old Town Substations will be remodeled and enlarged. About six miles of 13-kv. lines will be extended into the Lakes District.

Our connected load has increased about 30,000 kw. during the year while our kilowatt-hour sales have increased over 21 per cent. As a result, studies are now in progress to determine which of several adjacent hydro sites, ranging from 60,000 to 150,000 kw. installed, can be most economically developed to meet Tacoma's requirements. If, as and when authorized, possibly early in 1941, this work will be carried on under a separate construction budget aggregating several million dollars.—*Verne Kent, superintendent.*

PHOENIX PLANT, one of P G and E's smaller hydro stations, was modernized last year. This is the switchyard after modernization. The plant is now semi-automatic operation

Washington Water Power

The Washington Water Power construction budget for 1941 is $1,838,850 as compared with $1,821,170, which was spent for new and improved facilities in 1940.

The installation of short wave radio equipment for dispatching line crews was completed in 1940, as was the first step in the construction of the Sunset substation in Spokane. The second step is expected to be completed in 1941.

Although the generating capacity was not increased, transformer capacity was augmented 10,000 kva. Ten miles of new 110-kv. line was added and nine miles of 60-kv. transmission was rebuilt. A total of 70 miles of distribution was also added.

Summary of 1941

Important programs scheduled for 1941 are: increase in general plant efficiency, construction of the second step of the Sunset substation at an estimated cost of $200,000, and construction of a new warehouse and service building in Spokane, estimated to cost $260,000, which will be built in order to improve the efficiency of operations.

Other scheduled improvements—in part—include the spending of substantial amounts for removing lines from streets to alleys, modernizing the street lighting system in Spokane, and for improving the general plant, including building additions.

Generating and transformer capacities will be increased by 13,700 kw. and 35,000 kva., respectively. Sixty miles of new distribution lines will be added and 15 miles of transmission will be rebuilt.

New forebay shear booms will be constructed at the Little Falls and Nine Mile plants and a steel water tank will be installed at the latter plant.

The company's 1941 program of better service and increased load building will be directed into channels providing the greatest aid to the United States' preparedness program. Complete cooperation with the nation's defense leaders will govern the Washington Water Power Company's activity in 1941.—*J. E. E. Royer, vice-president and general manager.*

THE SAN DIEGO TIE with Southern California Edison is carried partly on wood poles. The poles had to be carried over some tough ground, as is evident. Tractors help

Wyoming

Kendrick Project, USBR

Construction of 122 miles of 66-kv. transmission line was completed during 1940. This line connects Casper and Thermopolis, Wyoming, and the installation included the related substation equipment. I. J. Matthews is construction engineer.

The Sales Picture

Intelligence, in military terms, means knowledge of what's ahead. To plan campaigns such intelligence is needed. For the selling front of 1941, here it is, gathered from the utilities of the West
For Dealers—a projection of their opportunities for 1941 is here
For Contractors—measure of expectable business from installation
For Wholesalers—a check on their inventories for future delivery

ALL pictures, just now, are apt to be seen through a fog. But if the sales picture ahead seems to have clearer outlines than the pictures of other fields of activity it is because the figures of 1940 project themselves clearly. Thus by a sort of "instrument flying" 1941 can be plotted if not actually seen.

All indications from the figures and the comments of those who have compiled them point to about a 5% increase in ranges in 1941, but water heaters should take a longer step, perhaps 19%. Everyone is conservative about refrigerators—perhaps a 2% increase.

In the West, 1940 range sales exceeded 72,758; in 1941 should reach 76,250. Water heater sales are on the rise; in 1940 32,542; in 1941 they should be 39,542, a little better than one for every two ranges. Refrigerator sales in 1940, with the price drop, touched a new high of 357,000 units, but many utilities do not venture an estimate and all opinions agree on approximately the same number as this year's sales.

Figures in the tables tell a great deal and are worth study. For example, Cal-Oregon Power territory leads with 125.2 ranges sold per 1,000 residence customers, 92.5 water heaters, almost leads with 189.2 refrigerators. Unintah with 208 tops it. The ironer picture improves too; in Eastern Oregon territory 12.6 per 1,000 customers, PG and E with 10.3 and San Diego 10.8 show that there *is* a market when it is worked hard.

Saturations are highest in Sierra Pacific—57%, Idaho Power 56%, Cal-Oregon 45%, Seattle 46% for ranges. For water heaters: Seattle 28%, Washington Water Power and Idaho Power both 26%, Cal-Oregon 23%.

Six utilities now exceed 2,000 kw.-hr. average annual domestic consumption, and 29 utilities exceed 1,000 in these 11 Western States.

Building in 1941 should be 12% above 1940, which was no slouch at figures like 127,000 new residence meters, and $300,000,000 in new residential construction.

Supplementing and explaining some of the items in the tables, themselves compactly assembling almost all the figures, are comments from the utilities serving practically all the West. Together they give you the sales and business picture for 1941.

Arizona

Central Arizona L & P

Dealers in the territory of Central Arizona Light and Power Co. made 97 per cent of the sales during 1940. Sales figures in the tables represent trade-in resales as well as new appliances. Range and refrigerator campaigns constituted the major promotional events of the year. Major competition comes from butane gas, the company selling natural gas.

In addition to the appliances listed, 4,281 home and 250 commercial evaporative coolers were sold; 32 home and 10 commercial air conditioning installations.

Sales personnel include 13 domestic, 4 commercial lighting and 2 industrial as well as 4 combination men. Policy on fluorescent is similar to that in the Edison Electric Institute resolutions. Stimulation of appliance sales is looked for from the defense program—*A. F. Morairty, Asst. General Manager.*

Tucson G, E L & P

An accurate survey of 5,135 of the Tucson Gas, Electric Light and Power Co. 5,918 rural resident customers was made during the past year and very accurate figures obtained as to the number and percentage of saturation of each of the appliances. Likewise, the survey covered all competing equipment found in these homes.

Since the company does not merchandise, the sales figures for the year and quotas for 1941 are all approximated. They also include the sale of trade-in appliances.

During the past year, a rate reduction of approximately 10% was made June 1. Major competition is natural gas which the company also sells.

The sales of air conditioning equipment in the territory is approximated at 1,500 home and 100 commercial evaporative coolers; 25 home and 5 commercial installations involving refrigeration. Saturation of evaporative coolers is about 35%. On fluorescent lighting we require 90% power factor correction or better. Wing base of the U. S. air force with 150 houses will constitute a major piece of new business in 1941.—*W. H. Howe, Commercial Manager.*

With open house Pacific Power & Light celebrated 30 years of service to the public

Arizona Edison

Arizona Edison Co., Inc. of Douglas, Ariz., does not merchandise but it assisted dealer sales by the holding of spring and fall open house showings of dealer appliances on the company floor, conducted roaster, electric range, washer and ironer demonstrations; conducted three series of cooking schools and held dealer-employee meetings.

California

Alameda Bureau

Because of the new navy base in Alameda, the Bureau of Electricity, City of Alameda, Calif., believes population should increase and with more building, domestic major equipment should show a healthy increase. The kw.-hr.-consumption figure is for the fiscal year ending June 30, 1940, as compared to the year ending June 30, 1939.

There has been no change in our dealer plan inaugurated last year. In it dealers do all of the merchandising, the utility furnishing the wiring for ranges of 7.5 kw. or over and electric storage type water heaters. These must be approved by the utility and be of 2.5 kw. or over. Also air heating equipment of 2 kw. or over. Wiring is furnished in open type single-family dwellings and separately metered flats and apartments where the number of flats does not exceed four in number.

The utility also runs full-page advertisements in local newspapers and offers help to dealers with advertising alongside of the utility institutional advertisements. The utility pays up to $40 in any one calendar month of dealer advertising, providing the copy includes the utility's name and an appropriate appeal for the use of electricity featuring major domestic equipment, portable appliances of 1000-watt or more capacity, electric refrigerators, floor and table lamps having I.E.S. specifications or equal.—*G. A. Baxter, Secretary.*

Coast Counties G & E

We do not have the data in "bang-up" accurate form as you would like to have it and if it isn't accurate, it shouldn't be printed. Please excuse us this time.—*H. W. Edmund, Sales Manager.*

Glendale Public Service Dept.

The City of Glendale, Calif., Public Service Dept. makes the necessary wiring installation for the operation of electric ranges and electric water heaters. A small charge is made for this service. The department also maintains a service department for repairs to electric ranges and water heaters. The organization sells approximately 40 percent of appliances on its lines.—*Ward C. Hosier, Electric Range Division.*

Imperial Irrigation Dist.

Imperial Irrigation District carries on a cooperative program with dealers in advertising campaigns and by putting on cooking schools in the larger towns. Through the Electric Home and Farm Authority financing, we have aided dealers in financing some $500,000 worth of merchandise sales. The utility itself makes no sales to customers.—*M. J. Dowd, Chief Engr. and General Supt.*

Los Angeles Bureau of P & L

Changes in our policy with respect to promotional efforts during the past year are now practically completed and we believe that next year the sales of major domestic appliances will continue at increasing growth, with the dealer and distributor taking more of the burden of merchandising in this area. We also feel that public acceptance of these appliances has improved nationally, to the extent that the manufacturer will provide more extensive advertising and promotional work.

Progress has already been made in the interest of appliance sales in this territory, with the establishment of a policy by the dealers to include uniformly installation cost in the quoted price of electric ranges and water heaters, this cost being divided between the utility and the distributor.

The Bureau participated in the Housing Show in the spring and had special exhibits in the Food Show during the fall. The "Matchless Electric Home" was open all year around with an attendance of approximately 50 persons per day who were given a thorough explanation of the benefits of electrical

usage in the home. Special signs illuminated at night for new homes and apartments that are equipped electrically have been provided to the builders.

Instead of home service girls, the Bureau now employs demonstrators who assist with cooking demonstrations for dealers and in cooking schools.

On the commercial and industrial side, business conditions were above normal in 1940 but slightly below 1937. The defense program should increase appliance sales in this locality because of the employment increase. The Bureau employs 22 domestic, 4 lighting and 26 combination salesmen. During the year the lighting program resulted in approximately 4.500 kw. of commercial and industrial lighting. A very successful promotional activity was conducted among large office buildings. On fluorescent lighting we promote it for special applications, decoration and high intensity general lighting of 50-ft. candle and over. We require power factor correction on all installations of 2 lamps or multiples of two.

During the year we have record of 75 commercial, 10 industrial and 4 home air conditioning installations involving refrigeration.

In the industrial field, this territory has in it furniture, airplane, motion picture and tire and rubber manufacturing industries. Total power load added, inclusive of commercial power, during the year was 20,000 kw. We look for a greater acceptance of infra-red drying during 1941. Major competition is natural gas.

The dealers in this territory are forming a group to combat price cutting and fly-by-night tactics. In all such efforts the Bureau personnel endeavors to be helpful for the benefit of the industry.

—E. V. Kane, Business Agent.

CUSTOMERS AND CONSUMPTION

UTILITY TERRITORY	Residential customers			Average annual kw.-hr. consumption—Residential					Commercial customers		Industrial customers		Load increases kw.			
	1939	1940	of which are rural	1940	1939	1938	1937	1936	No. 1940	Ave. ann. consump.	No. 1940	Ave. ann. consump.	Agric.	Indust.	Oil	Mining
Alameda, City of	10,703	10,860		1,261	1,142	971	968	857	1,060		2					
Albuquerque G. & E.		14,153		620	605				1,984		656					
Anaheim Mun. L. & W. Dept.		3,178		650	640				883							
Arizona Edison		12,146		736.5	655				2,097		341					
B. C. Elect. Ry., Vancouver	90,751	93,000	9,000	1,040	1,026	1,003	991	977	15,800	4,268	2,610	72,000	35,000	9,000		500
B. C. Elect. Ry., Victoria	19,490	20,788	3,591	834.7	801.6	760			3,089		451		E.A.R.			
Burbank, City of	10,028				850	828	853									
Calif.-Oregon Pr.	28,300	29,119	3,254	2,374	2,243	2,167	2,100		6,594		105					
Central Arizona L. & P.	24,839	25,800	905	1,124	1,038	975	910	821	3,900	10,552	281					
Cheyenne L. F. & P.		5,646		930	905				854		73					
Coast Counties G. & E.	19,978															
Colorado Central P.		20,000	12,000	780	768				1,000		20					
Colorado Springs, City of		12,800		827	782				2,650		25					
Colorado Utilities Corp.		1,294	29	600					463		6					
Eastern Ore. L. & P.	6,349	6,519	775	1,044	919	850			1,810	9,744						250
El Paso Electric	21,442	22,200	1,560	1,180	1,128	1,058	952		3,430	7,500	110	570,000	200	500		
Eugene, City of		8,623		2,550	2,379				1,315		364					
Grays Harbor PUD	9,568	10,341	1,489	792	652	618			1,707	7,944	16	1,527,648	48	600		
Glendale, City of	24,300	25,279	134	1,032	1,010	971			3,485		1,316					
Hawaiian Electric	38,630	41,500		1,225	1,123				9,214	7,100	244	280,000				
Idaho Power	52,683	57,000	16,900	1,950	1,855	1,719	1,577	1,358	6,800	6,500	890	77,500		1,500		
Imperial Irrigation Dist.		8,554	2,995	1,520	1,430				1,674							
Logan, City of		3,824			1,994				560							
Los Angeles B. P. & L.	403,007	418,000		945	886	838	782	692	92,700	8,650	2,230	122,100				
Modesto Irrigation Dist.		8,596	4,696	1,296	1,224				2,900		100					
Montana Power	67,500	70,000	3,000	920	875	839	815	781	11,000	5,500	1,200	950,000				
Mountain States Power	49,200	51,700	7,762	1,345	1,286	1,247	1,156	972	9,127		2,994			6,480		
Nevada-Calif. Elect.	25,870	26,000	1,456	1,340	1,376	1,370	1,291		4,285	7,211	330	334,242	845	195		927
Northwestern Elect.	31,664	34,236	4,891	1,515	1,423	1,354	1,308	1,240	5,897	10,412	602	384,393				
Pacific G. & E.	684,236	711,734	36,000	1,027	985	945	849	791	132,000	5,289	30,000	65,484				
Pacific Power & L.	56,847	60,950	12,500	1,689	1,606	1,550	1,475	1,382	8,758	5,700	570	107,000		2,700		
Pasadena, City of	27,554	27,800		1,022	981	929	887		3,475							
Portland Gen. Elect.	120,332	124,959	40,973	1,518	1,390	1,317	1,237	1,160	14,232	8,896	301	1,037,761	2,400	2,100		
Provo, City of		4,155		1,080					453		104					
Public Service Co. of Colo.	112,059	115,823	4,695	759.2	700.5	653	620	579	18,723	5,576	6,630	31,761	335	3,450		3,900
Puget Sound P & L.	172,209	179,760	90,446	1,511	1,391	1,295	1,236	1,141	23,997	10,418	615	554,191		1,455		
Raton Pub. Service		1,581		991	841				563							
Rawlins Electric		1,300		700	655				435		1					
Riverside, City of		10,478		936	768				1,658		339					
San Diego G. & E.	77,346	82,963	13,200	994	953.7	896	835	733	13,580	5,191	4,930		200	2,100		
Seattle, City of	80,419	80,500		1,703	1,492	1,384	1,268	1,125	9,206	9,365	3,266	32,874		12,500		
Sheridan County Elec.		2,928	431	747	670				876		9					
Sierra Pac. Pr.	12,289	13,000	774	1,591	1,466	1,440	1,354	1,181	2,500	10,318	120	260,408	100	300		2,100
Southern Calif. Edison	433,800	459,500	27,500	980	972	945	910	801	65,500	4,025	2,600	46,630	11,100	51,500	5,370	
Southern Colo. Pr.	21,777	20,850		930	891	838	741	682	3,290	3,200	1,260	19,000				
Southern Nev. Pr.		2,620		2,800	2,546				879		1					
Tacoma, City of	32,325	33,600		2,100	1,961	1,804	1,632	1,614	3,925		989					
Telluride Power		5,077		600	555				696		70					
Trinidad Elec. T. Ry. & G.		4,317	600	615	603				860		31					
Tucson G. E. L. & P.	14,116	14,682	5,918	988	932	911	876		1,809	11,024	6	327,225				
Turlock Irrigation Dist.		5,533	1,794	2,700	2,582				1,110		23					
Uintah Power		625	105	585	505				158		25					
Utah Power & Lt.	104,346	105,925	17,989	1,212	1,140	1,068	1,067	876	10,110	6,772	1,217	444,573		10,700		4,885
Washington G. & E.		4,184	42	1,300	1,163				387		123					
Washington Water Pr.	66,659	70,340	6,640	2,193	2,060	1,985	1,879	1,775	9,550	9,184	603	849,453		3,837		2,228

Modesto Irrigation Dist.

Modesto Irrigation District does not merchandise but does provide free wiring for ranges and water heaters. Sales were about 30% below 1939 in the district. Kilowatt-hour consumption as reported is for city domestic customers to the extent of 3,900, domestic-rural customers 4,696, and 2,900 commercial and 100 industrial accounts. The city average kw.-hr. consumption for resident customers was 1,296. The rural kw.-hr. consumption was 2,496 in 1940 as against 1.224 kw-hr. for city and 2,376 kw.-hr. for rural domestic customers in 1939.

Nev-Cal Electric

Serving a far-scattered territory in the Imperial Valley, the Nevada-California Electric Corp. had fair business during 1940. The commercial and industrial lighting programs resulted in 496 kw. of added load with an estimated yearly revenue of $15,810. Its policy on fluorescent lighting is to require 90% or better power factor. Fluorescent jobs are recommended with the proper engineering. Gas is the major competing fuel. During the year reductions in rates were made in all of the territories of the company, reducing both the top blocks and the minimums. The company has no dealer cooperative setup. It participated in the National Orange Show, Hemet Turkey Show, Imperial County Fair, West Riverside Harvest Festival, and Riverside County Fair. — *George C. Bigelow, General Commercial Manager.*

Pacific Gas and Electric

A summary of appliance sales volume with few exceptions shows satisfactory increases over previous years' records. Healthy economic conditions in this area, plus a full program of

1940 ACCOMPLISHMENT

UTILITY TERRITORY	No. of resident customers	Average annual kw.-hr. per resident customer	kw.-hr. increase 1940	Spent for appliances	Average per home $	Ranges Sold		Water Heaters Sold		Refrigerators Sold		Washers Sold		Ironers Sold		IES Lamps Sold		% of total volume sold by dealers
						1940	per 1,000 homes	1940	per 1,000 homes	1940	per 1,000 homes	1940	per 1,000 homes	1940	per 1,000 homes	1940	per 1,000 homes	
Alameda, City of	10,860	1,261	19			160	14.7	20	1.8	300	27.6							100
Albuquerque G. & E.	14,153	820	15															100
Anaheim Mun. L. & W.	3,178	650	10			6	1.9	0										100
Arizona Edison	12,146	736	81			78	6.4	30	2.4	1,934	159.2							100
B. C. Elec. Ry., Vancouver	93,900	1,040	14	2,250,000	24.00	1,148	12.2	51	5.5	3,213	34.2	3,295	35.1	85	0.9	2,500*	26.6	84
B. C. Elec. Ry., Victoria	20,788	834	33	500,000	25.00	197	9.5	19	0.9	492	23.6	669	31.7	14	0.7			75
Calif.-Ore. Pr.	29,119	2,374	131			3,656	125.2	2,699	92.5	5,500	189.2							40
Central Arizona L. & P.	25,800	1,124	86	1,342,699	52.00	174	6.7	72	2.8	3,548	137.5	1,751	67.8			7,276	282.0	97
Cheyenne L. F. & P.	5,646	930	25			90	16.0			350	62.0							75
Colorado Central P.	20,000	780	12			20	1.0	10	0.5	160	8.0							100
Colorado Springs, City of	12,800	827	45			88	6.8	10	0.7	300	23.4							100
Colorado Utilities Corp.	1,295	600																100
Eastern Ore. L. & P.	6,519	1,044	125	275,000	40.00	242	37.2	164	26.2	775	129.0	554	89.6	82	12.6	820	126.0	73
El Paso Electric	22,200	1,180	52	700,000	19.00	335	15.1	385	17.3	1,950	87.9	310	14.0	37	1.6	3,600	162.0	60
Eugene, City of	8,623	2,550	171			590	68.5	400	46.5									100
Grays Harbor PUD	10,341	792	140	258,300	23.50	230	22.4	170	16.4	1,000	116.2	700	68.0	60	0.6	800	77.0	100
Glendale, City of	25,279	1,032	22			300	11.9	35	1.4									60
Hawaiian Electric	41,500	1,225	102			1,750	30.5	975	23.5	3,750	90.4	3,000	72.4	110	2.6	4,750	114.4	
Idaho Power	57,000	1,950	95	3,577,378	65.25	3,808	65.6	1,575	27.7	8,262	145.0	5,233	91.8			5,763	101.0	90
Imperial Irrigation Dist.	8,554	1,520	90			300	35.1	150	17.5	800	93.7							100
Logan, City of	3,824	1,994				127	33.2	24	6.3									100
Los Angeles B. P. & L.	418,000	945	59	1,210,000	1.65	6,000	14.3	3,100	7.4									100
Modesto Irrigation Dist.	8,596	1,296	52			105	12.2	64	7.4	385	44.8							100
Montana Power	70,000	920	45	3,244,800	46.25	2,936	41.9	287	4.1	8,112	116.0	6,185	88.5			12,600	180.0	70
Mountain States Power	51,700	1,345	59			1,600	30.9	540	10.5	5,400	72.2							90
Nevada-Calif. Elect.	26,000	1,340			25.00													
Northwestern Elect.	34,236	1,515	92	2,475,856	82.67	2,708	79.2	1,130	33.0	4,951	144.6	3,483	101.8			8,725	255.0	100
Pacific G. & E.	711,734	1,027	42	28,000,000	40.00	5,200	7.3	3,100	4.4	76,500	107.7	43,400	61.2	7,300	10.3			75
Pacific Power & L.	60,950	1,689	83	3,774,853	62.11	2,637	43.2	1,588	12.7	9,073	149.0	6,817	112.0	567	9.3	17,512	288.0	89.7
Pasadena, City of	27,800	1,022	41			265	9.5	98	3.5	2,100	75.5							100
Portland Gen. Elect.	124,959	1,518	128	4,350,000	30.00	6,543	52.3	2,960	23.7	11,200	89.7	8,175	65.5	800	6.4	16,500	132.0	100
Provo, City of	4,155	1,080				35	8.4	10	2.4									100
Public Service Co. of Colo.	115,823	759	59	1,112,678*		552*	5.4	119*	1.1	2,898*	24.3	889*	7.4	447*	2.1	9,657*	74.1	
Puget Sound P. & L.	179,760	1,511	109	5,857,487	32.72	9,316	52	4,931	27.5	22,716	126.6					20,581	139.2	90.1
Raton Pub. Service	1,581	991	150			18	11.4	5	3.1	34	21.5							100
Rawlins Electric	1,300	700	45			2	1.5			23	17.7							
Riverside, City of	10,478	936	168			241	23.0	51	4.9									100
San Diego G. & E.	82,963	994	51	3,410,000	45.00	600	7.2	525	6.3	10,700	130	5,875	70	985	11.9	6,911*	83.2	90
Seattle, City of	80,500	1,703	211			5,000	62.1	2,975	37.0	650*	8.6							
Sheridan County Elec.	2,928	747	77			61	20.9											100
Sierra Pac. Pr.	13,000	1,591	90	780,000	60.00	1,091	84.0	297	22.9	1,748	134.5							100
Southern Calif. Edison	459,500	980	8	14,000,000	31.00	4,700	10.2	1,850	4.0	43,857	95.1	29,606	64.0	3,936	8.5	15,000	32.7	90
Southern Colo. Pr.	20,850	930	38	200,000*	27.00	560	26.9	243	11.7	2,370	113.9	1,924	92.5	140	6.7	2,344	112.9	70
Southern Nev. Pr.	2,620	2,800	254			20	7.6	8	3.1	12	4.6							100
Tacoma, City of	33,600	2,100	39			1,670	49.7	1,315	39.2									
Telluride Power	5,077	600	44			117	23.0			254	50.1							40
Trinidad Elec. T. Ry. & G.	4,317	615	12			35	8.1	1	0.2	275	63.6							99
Tucson G. E. L. & P.	14,682	988	56			175	11.8	50	3.4	1,500	101.4	1,000	67.7	25	1.7	600	40.5	100
Turlock Irrigation Dist.	5,533	2,700	118															50
Uintah Power	625	585	80			25	40.0	15	24.0	130	208.0							50
Utah Power & Lt.	105,925	1,212	72	6,712,422	63.37	3,958	37.3	810	7.7	13,919	131.0	9,451	82.2	792	7.4	16,623	156.8	94.7
Washington G. & E.	4,184	1,300	237			100	23.9	90	21.5									
Washington Water Pr.	70,340	2,193	133	4,103,456	58.35	4,179	59.5	3,287	45.4	9,991	141.9	6,357	90.2	553	7.9	9,592	136.4	75

*Company sales only.

DEALERS—HOME SERVICE—PROMOTION

UTILITY TERRITORY	No. of dealers	WHICH DO MAJOR BUSINESS*					HOME SERVICE			KITCHEN PLANS				Name of promotional association or agency
		Dept.	Furn.	Mail Order	Elect.	Others	How many girls	Do they sell	Promote light sales	By utility	By ind. bureau	By mfg.	By dealer	
B. C. Elect. Ry., Vancouver	110	3	2	5	1	4	6	No	No	x	No	Some	Some	Electrical Service League of B. C. and Home Appliance Council.
B. C. Elect. Ry., Victoria	16	2	3	0	1	4	2	No	No	x				
Calif.-Oregon Pr.	35	3	4	2	1	5	2	No	Yes	x				
Central Arizona L. & P.	166	5	2	1	3	4	7	Yes	Yes	x			x	
El Paso Electric	40	2	1	3	4	5	2	No	No	x				Elect. Refr. Bureau of El Paso, Evap. Cooler Dealers Assn. and Elect. League of El Paso.
Grays Harbor PUD	12		1	2	3	4	1	No	No	x			x	
Hawaiian Electric				2	1		5	No	No	x				
Idaho Power	305	2	4	3	1		22	Yes	Yes	x				Electrical Equipt. Sales Assn.
Los Angeles B. P. & L.		3	4	2	1	5	14	No	No	x				
Montana Power	250	3		2	1		16	Yes	Yes			x		
Mountain States Power	120		2	4	1	3	4	No	No			x	x	Rocky Mt. Elect. League in Wyo.
Nevada-Calif. Elect.	45	5	1	4	2	3	5	No	No	x				
Northwestern Elect.	700	1	2	1	3		11	No	No		x		x	
Pacific G. & E.	1,180						15	No	Some			x	x	Electric Appliance Society.
Pacific Power & L.	382	3	2	1	4		13	Yes	Yes			x		
Portland Gen. Elect.	205	3	2	4	1	5	6	No	No	Part	Newsp.	Part		
Public Service Co. of Colo.							1	No	Yes	x		x		Rocky Mt. Electrical League.
Puget Sound P. & L.	500	1	2	4	3	5	17	No	Yes	x		x	x	12 Dealer contact men.
San Diego G. & E.	200	4	2	3	1	5	1	No	No					Bureau of Radio & Elect. Appliances.
Seattle, City of	125	1		2	3	4	2	No	No	x			x	
Sierra Pac. Pr.	67			2	1		1	No	No				x	
Southern Calif. Edison	334	5	4	3	2	1	10	No	No	x	x	x	x	
Southern Colo. Pr.	40	3	4	2	1		1	No	Yes	x			x	Pueblo and Rocky Mt. Elect. Leagues.
Tacoma, City of		1	2	3	4	5	2	No	No	x		x		
Tucson G. E. L. & P.	20	3	4	1	2	5							x	
Utah Power & Lt.	656	2	4	3	1	5	10	No	No			x		Electrical League of Utah.
Washington Water Pr.	135	1	3	4	2	5	19	No	Yes	x	x			Inland Empire Electrical Equipt. Assn.

*Arranged in order of the volume they do

cooperative campaigns and promotions designed to intensify dealer activity, have, in our estimation, been important factors in bringing about this condition.

Additional impetus will be given to the promotion of major electric appliances in 1941. The new electric rate reduction recently announced makes available a new low-cost-of-operation sales tool which should be very effective. There will also be an intensified sales effort in the field and some definite industry-wide cooperative campaign activities on electric ranges and water heaters.

In addition to the figures given in the table, there were sold on the company's lines in 1940, 1,350 major air heaters in addition to the auxiliary air heaters. In 1939 there were 1,862 sold.

In explanation of the saturation figures, there is a difference in the combined gas and electric territory over the straight electric territory. The figures in the tables are the total but the break-down of the saturations in each of the types of territory may be of interest.

Actual customer surveys showed saturation for ranges of 4% in the combined territory, water heaters 2%, refrigerators 47%, washers 59, ironers 10, cleaners 64, radio sets 94 and major air heaters 2. In the straight electric territory, range saturation is 28, water heater 19, refrigerators 56, washers 69, ironers 9, cleaners 30, radio sets 90 and major air heaters 3%.

Major events of a promotional nature during the year included the exhibit at the Golden Gate International Exposition demonstrating electric kitchen appliances and at the Sacramento State Fair and various county fairs.

In the dealer set-up several changes will be made to bring about an even closer dealer cooperation. The company maintains a staff of appliance counsellors and dealer sales promotional representatives.

Oil and butane, with increased butane competition, have been the major competing fuels during the year. The company sells both natural and manufactured gas in some of its territory.

The company maintains a staff of 70 domestic, 25 lighting, 15 industrial, 17 miscellaneous commercial and 31 domestic combination men. Domestic lighting increased during the year 16% and commercial lighting 9%. The company's policy on fluorescent lighting has already been published in ELECTRICAL WEST. Briefly, it calls for power factor correction to 90% and properly engineered installations, cooperation in every possible way with those selling on an ethical basis in the interests of the customer.

Business conditions showed approximately a 10% improvement over 1939 and another 10% is looked for in 1941.—*O. R. Doerr, General Sales Manager.*

Pasadena Light Dept.

Free installation of ranges in single-family dwellings served with an overhead service is provided dealers under our co-operative set-up. No sales are made through the organization. Notable additions in load to the lines of the utility were made in all appliances.—*B. F. DeLanty, General Manager.*

Riverside Lighting Dept.

We do not do any direct merchandising at the city of Riverside Lighting Department but we cooperate 100 percent with our local dealers. We carry on cooperative advertising, put stuffers in all of our daily mailings, carry advertising messages on our monthly bills with a change every month and conduct home demonstration service and provide free wiring. Only sales made are about 1 per cent of the ranges to our own employees.

The defense program should affect sales in this territory as we have March Field located close by. We have a lot of activity going on all around us and our sale of kw.-hr. has very definitely increased because of this. As to appliances, I am sure that their sale will be helped very much.—*C. S. Dahlgren.*

San Diego Gas & Electric

Continued increase in aircraft plants and defense expenditures of various government projects in this area should increase industrial business as it has during the past year. The reflection of

this should be found in appliance sales because of increases in population. Much of the merchandising promotional effort in this area is carried by the Bureau of Radio and Electrical Appliances of San Diego County.

During the year a reduction was made in domestic rates effective Nov. 1, 1940, amounting to approximately $82,000 annual saving.

In domestic lighting the company has a lamp crew of 8 men and a supervisor; figures on I.E.S. lamps are available only for company sales. Of the total dollar volume of appliance sales for 1940, $3,410.000, company sales accounted for but $339,176.

The company sales crew consists of 21 domestic, 3 lighting, 7 cooking and heating, 3 industrial and 4 combination men. Industrial and commercial load increase for the year was 3,000 kw., residential 11,000 kw. In 1941 we estimate commercial will be 3,000 kw., residential 17,000 kw.

On fluorescent lighting the company approves of it if installed according to recommended lighting practice. It insists on power factor correction.

Natural gas is the competing fuel to electricity and is sold in this territory by the company. A REA project was added to the lines, served at a wholesale rate.

The population of San Diego, according to the 1940 census, was about 202,000 and by July, 1941, it will probably exceed 260,000. Private investors plan to build around 3,000 new homes in the San Diego area during 1941. The federal government will also build two housing projects, one a navy housing project and another a defense housing project under the Federal Works Agency. The navy is building 1,200 dwelling units, 600 near the destroyer base and 600 across from the marine base.

The Federal Works Agency project will be located near the site of the old Camp Kearney to take care of approximately 10,000 people. In many respects San Diego has all the promise of a boom town for the year 1941.—*A. E. Holloway, Vice Pres. in charge of Sales.*

So. Calif. Edison

In connection with 1940 sales activities, our various promotional campaigns and selling efforts in general were highly successful. Virtually all of our 1940 objectives were accomplished.

Continued and added emphasis will be placed in 1941 on electric range and water heater promotion. It is anticipated that with the generous and more uniform wiring allowances being offered throughout southern California, both range and water heater sales will be materially increased. The effect of defense plans on sales programs we are beginning to feel already in greatly augmented payrolls in the defense industries of our territory. Naturally, as these defense industry payrolls further expand, local business conditions are bound to improve.

Promotional events during the year were participation in the Los Angeles County Fair, the San Bernardino Orange Show and the Tulare-Kings County Fair.

A rate reduction of $400,000 was made effective Mar. 1, 1940 covering the entire territory. Rates for domestic lighting used in excess of 50 kw.-hr. per month were reduced in general. The territory served is 55% urban, 16% agricultural, 29% industrial. Industries include oil, rubber, moving pictures, aircraft, steel manufacturing and processing, citrus production and shipping. Business increased about 1½% over 1939. Natural gas is the competing fuel, served by other utilities.

The company has on its staff 150 domestic, 19 lighting, 12 cooking and heating, 16 industrial and 24 other salesmen.

The company's lighting program resulted in continued acceptance of the principles of good lighting in the home. New commercial and industrial lighting revenues signed in 1940 were $1,103,000. The 1941 quota is $1,237,500. Our policy on fluorescent lighting is to promote it provided that it is done on a constructive basis and power factor is corrected to 90%.

Evaporative coolers to the number of 2,040 were sold for home use and 228 kw. of home air conditioning involving refrigeration were reported.

We look to expansion of the aircraft industry, steel industry and all manufacturing plants which can manufacture munitions. Industrial sales department quota is being increased about 8 1/3% over 1940.—*R. C. McFadden, Sales Manager.*

Turlock Irrigation Dist.

The district does about 50% of the sales of major appliances in the district but carries on a cooperative program with dealers. While no specific unit sales of appliances were given, it was estimated that 2,000 kw. of new ranges, water heaters and refrigerators were installed during the year.

Anaheim Light Dept.

The Municipal Light and Water Dept. of Anaheim, Calif., has no connection with merchandising sales. None were made through the organization but we cooperated to the extent of giving wiring allowances for new ranges and water heaters.—*V. W. Hannum, General Supt.*

Colorado

Public Service Co. of Colo.

Probable increased requirements of the coal and metal mining industries, a probable 10,000 kw. increase in load at an Army air school and general expansion of manufacturing requirements should improve sales and business conditions in the territory of Public Service Co. of Colorado in 1941. During the past year, 1000 h.p. was added at the National Biscuit Co. factory, 2700 h.p. to coal mine electrification, 400 kw. to a new department store.

Dealer figures are not available so that those reported for this area are for the company alone. Dealer totals would probably double these figures.

The Rocky Mountain Electrical League promotes the sale of electrical appliances, better lighting and adequate wiring. It also sponsors electrical shows, exhibits and educational meetings for all dealers and their salesmen. In addition to this, we have had cooking schools in all districts of our system, all of which stimulate the market for dealer sales.

In lighting, we maintain a full time crew of 22 men who make lighting surveys and sell lighting in homes.

During 1940, the number of commercial customers will show an increase of approximately 1,000 with an average increase in kw.-hr. per customer of 1,500. During the year extensive work was done on the park of Red Rocks, preparing this unusual outdoor theatre for an early summer opening.

Our work continued on commercial lighting equipment with a great many layouts for both commercial establishments and sports lighting. Our street lighting work consisted chiefly of the installation of one of the main cross streets in Denver and one underpass which took 22 units. Work has started on the 23rd Street extension where 44 16,000-lumen mercury vapor lamps will be used. During 1941 a very extensive street lighting survey will be made to be used as a basis for a 10-year modernization program.

There has been no change in our fluorescent lighting policy over 1939. We have concentrated during the past year on education, having had fluorescent lighting design schools and service schools in several locations throughout Colorado and New Mexico. The story of fluorescent has been told to most of our employees through frequent talks at regular employee meetings. We believe fluorescent lighting for 1941 will show very decided increase in number of units installed, and that the loads of the various companies in this territory will be protected due to

UTILITY AND DEALER APPLIANCE SALES

UTILITY TERRITORY	Total $ vol. co.-dlr. sales (000)	RANGES					WATER HEATERS					REFRIGERATORS					WASHERS				
		1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940
B. C. Elect. Ry., Vancouver	2,250,000	939	1,148	1,115	30#	14.2#	100	51	85	10#	3#	1,894	3,213	3,530	5#	14.9†	2,912	3,295	3,350	60#	47#
B. C. Elect. Ry., Victoria	500,000	148	197	172	33#	12#	26	19	10*		2.5#	415	492	450	8#		516	669†	600†		
Central Arizona L. & P.	1,342,699	172	174	200	10		60	72	80			2,222	3,548	2,800†	40		1,809	1,751	1,800†	50	
Eastern Ore. L. & P.	275,000	183	242	250	10		74	164	200			480	775	800	20		490	584	600	40	
El Paso Electric	700,000	358	335	400	2	19	356	385	375	.05	12	1,679†	1,950†	2,100†	7	65	254	310	400	5	20
Grays Harbor PUD	258,300		230	400	8.2	11		170	200		1.5		1,000	1,100	2.5	29		700	800	6.8	
Hawaiian Electric		1,042	1,250	1,500	6	20#	673	975	1,150	1	10#	3,105	3,750	4,350	33	72#	252*	3,000	3,400	20	50
Idaho Power	3,577,378	3,550	3,896	3,900	40	56	1,683	1,607	1,800	10	26	4,841	8,557	6,000	15	55	4,741	5,811	5,500	40	75
Los Angeles B. P. & L.	1,210,000	6,511†	6,000†	5,000	3	58	2,809†	3,100†	3,500†	2.5	2.4					60					
Montana Power	3,244,800	1,282	2,936	3,002	25	23	171	287	370	5	2	5,992	8,112	7,990	20		6,009†	6,185†	6,335†	75	
Mountain States Power		1,080	1,600				370	540				3,300	5,400								
Northwestern Elect.	2,475,856	1,653†	2,708†	2,655†	25	41.6‡	544†	1,130†	1,300†	10	9.7#	3,615†	4,951†	4,075†	15	54.8#	3,321†	3,483†	3,840†	30	69.6#
Pacific G. & E.	28,000,000	5,212	5,200	5,800	10#	9#	3,575	3,100	3,400	6#	5#	53,672†	76,500†	84,000†	25#	48#	37,426†	43,400†	43,400†	45#	62#
Pacific Power & L.	3,774,853	1,961	2,637	2,779	25.5‡	20	1,258	1,588	1,676	2.3#	12	6,053	9,073	9,344	16.7#	45	5,701	6,817	7,328	34.5#	85
Portland Gen. Elect.	4,350,000	3,762†	6,543†	7,500†	27	27.5	2,136†	2,960†	3,750†	4	10	5,335†	11,200†	11,300†	20	54	5,002†	8,175†	9,000†	35	62
Public Service Co. of Colo.	1,112,678*	591*	652*	780*	5	6	109*	119*	150*			1,724*	2,898*	3,400*	10	53	716*	889*	1,010*	25	61
Puget Sound P. & L.	5,857,487	5,509	9,316	9,300	30.2	32	2,929	4,931	5,600	8.4	14	10,716	22,716	22,300	6	48					
San Diego G. & E.	3,410,000	530	600	600			475	525	550			8,100	10,700	10,000			4,300	5,875	6,000		
Seattle, City of		3,567	5,000	5,000	27#	46#	1,776	2,975	4,000	15#	28#	689*	690*	750*		46#					
Sierra Pac. Pr.	780,000	894†	1,091†	1,200†	15.7‡	57#	280†	297†	300†	3.08#	17#	1,071†	1,748†	1,400†	8.48#	75#					
Southern Calif. Edison	14,000,000	4,700	4,700	5,700	19	9.5	1,450	1,850	2,200	15	4	35,900	43,857†	40,000	10	60	27,100	29,606†	27,000	33	55
Southern Colo. Pr.	200,000*	460	560	650	15	22	161	243	300	2	6	2,012	2,370	2,300	25	45	2,132	1,924	2,125	50	75
Tacoma, City of		1,500	1,670	1,000			600	1,315	440												
Tucson G. E. L. & P.		175†	175†	175†	10	7	50†	50†	50†	20	2	1,500†	1,500†	1,500†	20	75	1,000†	1,000†	1,000†	20	50
Utah Power & Lt.	6,712,422	3,493	3,958	3,700†	30#	40.5#	990	810	800†	5#	6.5#	9,444	13,919	13,800†	30#	69#	8,953	9,541	9,900†	75#	82#
Washington Water Pr.	4,103,456	2,694	4,179	4,900	20#	29.2#	2,375	3,287	3,500	20#	26.7#	7,510	9,991	10,410	30#	58.5#	5,848	6,351	6,900	60#	

UTILITY TERRITORY	IRONERS					CLEANERS					RADIOS					AIR HEATERS					IES LAMPS				
	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940	1939 co.-dlr. sales	1940 co.-dlr. sales	1941 co.-dlr. quota	% repl. 1940	% sat. 1940
B. C. Elect. Ry., Vancouver	65	85	105		2.7#	799	793	1,450	55#	65#	11,163	12,023†	13,000†	80#	83#	483	350	500*			2,500*	2,500‡			
B. C. Elect. Ry., Victoria	13	14	7			172	216	205			2,077†	3,453†	2,600†			120	172	65*							
Central Arizona L. & P.						2,409	1,475	1,500†	50		5,407	5,057	5,000†	70							9,231	7,276	5,000	30	
Eastern Ore. L. & P.	44	82	90			202	238	260	50		981†	990†	1,000†	60		60	75	100			770	820	900		
El Paso Electric	34	37	150	.05	1	286	490	360	3	40	1,400†	1,600†	2,000†	27	96	100	130	160	5	20	4,550	3,600	3,000	1	45
Grays Harbor PUD		60	100	16			270	250	9			1,600	1,400	18								800	700		
Hawaiian Electric	32*	110	150	1	1	928	1,100	1,450	4	20					93						5,320	4,750	5,000		15
Idaho Power						1,533	1,964	1,700	40	65	9,565	12,528	11,000	70	90						7,323	6,977	6,500	30	60
Montana Power						2,390†	2,659†	2,929†	75		17,292†	17,274†	15,000†	85					75		15,288	12,600	15,234	50	
Northwestern Elect.					9.7#	1,862†	2,832†	2,400†	50	67.2#	8,965†	10,466†	8,620	25	107.2#					9.4#	9,149	8,725	9,220	20	35.3
Pacific G. & E.	6,490†	7,300†	6,300†		10#	34,795†	36,500†	36,500†	60#	57#	140,149†	124,000†	136,500†	90#	93#	6,181	6,400	2,700	20#	2#					
Pacific Power & L.	478	567	642	12#	6	1,758	2,948	3,111	22#	50	13,624	16,228†	16,137†	43.7#	90	667	953	143*	56#		15,513	17,512	18,969	1.3#	15
Portland Gen. Elect.	702†	800†	900†		22	2,505†	6,400†	7,000†	50	66	15,000†	20,000†	22,000†	50	100	1,500†	1,250†	1,300†			17,534†	16,500†	18,000†		50
Public Service Co. of Colo.	171*	447*	440*		7	1,343*	1,471*	1,640*	80	67	873*	1,207†	1,300*	80	82	194*	190*	200*		15	8,136*	9,657*	10,000*		40
Puget Sound P. & L.																					24,000	20,581			
San Diego G. & E.	710	985	1,000			3,000	3,485	3,250			15,000†	16,600†	1,207†			1,850	2,300	2,500			5,702*	6,911*	8,000*		
Sierra Pac. Pr.																42†	93†	40†							
Southern Calif. Edison	3,400	3,936	4,000		4		11,314†		50	50	58,300†	73,329†	60,000†	50	90		1,484†				15,000	15,000	15,000		
Southern Colo. Pr.	217	140	250		5	562		575	50	70		4,300†	4,500†		100	106	115				2,112	2,344	3,500		35
Tucson G. E. L. & P.	25†	25†	25†	10	1	500†	500†	500†	20	30	1,000†	1,000†	1,000†	20	99	100†	100†	100†	5	3	600†	600†	600		35
Utah Power & Lt.	616	792	705†	75#	2#	4,579	5,699	5,700†	75#	80.2#	18,688†	19,070†	19,000†	75#	100#	912	842	664	75#	7#	16,185	16,623	18,000	30#	64#
Washington Water Pr.	370	533	390	50#		2,667	2,600†	2,586†	80#		21,460†	19,264†	23,730†	70#		1,308	1,283	3,900	40#		15,713	9,592	14,700	70#	

*Company sales only. †Dealer sales only. All others represent combined dealer and company sales. ‡Estimate on part of volume only. #Replacement or saturation figure authenticated by survey; others are estimated.

our effort in selling higher intensities.

Several rate exchanges were made in districts outside of Denver. Coal and natural gas are the chief competing fuels. Our sales staff consists of 88 domestic, 7 commercial lighting and 5 general commercial salesmen. There were 22 commercial and 3 industrial evaporative cooler installations made by the company in 1940.—*G. B. Buck, Vice President and General Commercial Mgr.*

Southern Colorado Power

Probably unit prices will be higher as an effect of the defense program on appliance sales, but we of Southern Colorado Power Co., Pueblo, Colo., anticipate an increase in volume because of better business conditions. It will call for more aggressive selling. No major changes are contemplated in our plans for 1941. We work closely with the Pueblo Electrical League, Rocky Mountain Electrical League and in personal contacts and meetings on varied promotional subjects through the Electrical League with dealers.

In our figures, estimated residential customers were lower than in 1939 because the city of La Junta with 1,738 residential customers became a municipal operation in April, 1940. We do not have exact dollar volume for dealer sales but have unit sales reported and combined with those of the company.

Major industry is mining although we serve an urban, agricultural and industrial community. Reduction in rates effective Dec. 1, 1940, ranging from 2 to 10 per cent depending upon kw.-hr. consumption, was put into effect. Gas is the major competing fuel. Our sales staff consists of 12 domestic and one commercial salesman. Results of our lighting program were satisfactory in 1940 and we anticipate continuation during 1941 by promotional efforts.

On fluorescent lighting we have made no special promotion as yet but have given assistance to customers to obtain proper installation. Evaporative coolers to the number of 37 commercial and 16 home installations and 2 air conditioning installations were reported in 1940.—*G. W. Millikan, Vice President in Charge of Sales.*

Idaho

Idaho Power

Predominantly an agricultural region with sugar beets, irrigation and cement plants as the large industrial customers, Idaho Power Co. concentrates heavily on domestic sales. There has been no change made since the first of last year in the merchandising and dealer set-up although at that time emphasis was placed in promotion and sales methods to develop more dealer business. The Electrical Equipment Sales Association has been active in this respect and the company has carried on schools and training programs. Some use is being made of the facilities under the Dean Act for such education.

Business was better than in any year since 1930. Major competition is coal and wood and the effect of the defense program on appliance sales, we believe, will decrease 5 per cent company and dealer sales. The company has 31 domestic salesmen and 10 combination salesmen on commercial, cooking, heating, industrial, etc. In commercial lighting, there were signed up 5,800 kw. of new load and 1941 looks like a better year. On fluorescent lighting, the company policy is cooperative promotion with dealers. Adequate power factor correction installation having the proper application is required.

We look to a slight extension of small industrials due to general betterment of conditions.—*R. E. Gale, General Sales Manager.*

Montana

Montana Power

A continuation of the improvement in 1940 is being looked for in 1941 by Montana Power Co. The average industrial load in Oct. 1940, was about 20 per cent higher than in the same month of 1939, because of increase in mining and allied industries. With the major industries of Montana, mining and smelting, and the need of the national defense program for products of these industries, continued improvement seems likely. Industrial consumption per customer is high on this account.

Major competition is natural gas and in some districts of the company, Montana Power also sells this.

The company has a crew of 36 domestic salesmen, 15 lighting salesmen, as well as 16 home service girls who sell and promote lighting sales.

Its policy on fluorescent lighting was stated in a bulletin sent to the trade Aug. 1, 1940. In this it set forth that fluorescent lighting must be correctly used to realize its advantages. It also offered the services of trained lighting engineers and recommended the Fleur-O-Lier fixtures as a quality guarantee.

A start in selling evaporative coolers was made last year with 140 connected jobs and 4 involving refrigeration.

In 1940, far more emphasis was placed on dealer selling and the percentage of dealer sales in the breakdown shows dealers matching the company in range, water heater sales and those of I.E.S. lamps and doing virtually all of the other appliance business.—*D. J. McGonigle, General Sales Manager.*

Nevada

Sierra Pacific Power

The Reno Plan continued to work like a charm this year and our results on major units were most gratifying. We made no change in our bonus set-up with the dealers and nothing is contemplated along these lines for '41.

We feel that defense plans will have a very definite bearing on the appliance business in the country during this year. As a matter of fact, it is extremely difficult to estimate with any degree of certainty the volume of business which will result because of these plans. We know there will be plenty of money in circulation and the desire on the part of the people to purchase will be very strong, but we are inclined to think that the manufacturers will not be able to produce the domestic appliances needed to meet the demand. Therefore, our estimates for next year are made with some reservations.

Our domestic rates were reduced on May 1, 1940; the first block of 30 kw. hr. was reduced from 6 c. to 5c.

Major industry is mining. We had installations in mining load of 900 kw. at the Dayton Dredge, 400 kw. at Crown Mine and 400 kw. at West Coast Mine. There will probably be an increase of 400 kw. of industrial load in 1941, and no large increases in mining load are anticipated. Oil and butane are the principal competitors, the company serving a limited manufactured gas service.

Results of our lighting program during 1940 have been successful through the cooperation of contractors, dealers, architects. Such jobs as rewiring and relighting of the state capitol, wiring and lighting specifications on new commercial buildings and relighting of many local business houses has been realized this year. An increased interest in sports lighting was noted in this year. One baseball and four softball fields were completed during the past season. The increased commercial lighting load for 10 months was 189 kw. and another 295 kw. for sports lighting.

Our fluorescent lighting policy to date has been full cooperation with dealers on their problems and a few pioneer jobs where recommendations were made for its use. We now have several 75 to 100 ft.-candle installations in actual use by customers. As of this date, it has not been necessary to file a power-factor restriction, although serious consideration has been given to it.

The new business for next year appears encouraging. This is based on the fact that a number of new buildings are now being planned by local architects.—*A. L. Pierce, New Business Dept.*

Southern Nev. Power

Full page advertising in local daily papers for all dealers from time to time to assist in their merchandising and load building has been the program of Southern Nevada Power Co. at Las Vegas, Nev. The company itself does not merchandise. It also feels the defense program will have little effect on sales in its territory.

New Mexico

Albuquerque

Albuquerque Gas and Electric Co. assists dealers by the use of much newspaper and radio advertising, conducts some schools such as lighting, and gives other sales help regularly. Since it does not merchandise, there is no set-up for a record of sales by dealers.

Raton Public Service

Raton Public Service Co. of Raton, N. M., has no special set-up for dealer cooperation. However, it does work with all dealers, holding schools as well as in local advertising. In its listing of customers, commercial and industrial are grouped together because it has a few small industries only.

Oregon

California-Oregon Power

All merchandise sales activities are set up to include the dealers. The dealer has access to company stocks at regular cost price. We finance the dealers' range, refrigerator and water heater paper. We do advertising for the dealer and pay our own men the same amount on dealer sales on which they participate as on sales made through our own merchandise stores. Dealer sales during the year were 500 ranges, 350 water heaters and 1900 refrigerators out of the totals given in the tables. Sales for the year were slightly over 100 per cent better than in 1939. No definite quota has been set for 1941.

As for the defense program, it has had a negative effect up to the present time with the exception of the lumber industry. Farm prices have not increased materially and we are losing our skilled labor to the industrial centers. We have had a large number of retired Army and Navy people return to service who have moved their families out of the territory.—*Glenn Jackson, Vice-Pres. and Merchandising Mgr.*

Eastern Oregon L & P

With a territory whose major industries are stock raising, mining, lumbering, the Eastern Oregon Light & Power Co. and dealers had a very favorable year in 1940. Figures given in the tables give the statistics of that business. Commercial and industrial customers are grouped together.

Our sales staff consists of 4 combination men. During the year there were sold 20 commercial evaporative coolers and 2 air conditioning jobs using refrigeration. Our policy on fluorescent lighting is to promote it. Major competing fuel is gas. During the year we conducted a series of cooking schools. We look for about the same business as last year during 1941.—*Leroy A. Grettum, General Manager.*

Eugene Water Board

Cooperation of the Eugene Water Board of Eugene, Ore., with dealers consists of running at least one, sometimes more, advertisements weekly in each of the two local papers and financing of appliances through Electric Home and Farm Authority. Figures are available on ranges and water heaters through the connections made but refrigerator and other appliances are not tabulated. No study has been made on the question of the effect of the defense program on the sale of appliances in this territory.—*J. W. McArthur, General Supt. & Secty.*

Mountain States Power

Primarily all of the merchandise sold in the Mountain States Power Co. territory is sold by dealers. The only exceptions to this are that the company is directly selling ranges and water heaters in the Sand Point, Idaho, division; on ranges, lamp bulbs, adaptor type units and a limited amount of commercial lighting equipment in the Wyoming division. In all of the other divisions of the company, its Montana and Oregon properties, all sales of electrical appliances and apparatus are handled by dealers, since January, 1938.

During the year 1940 this company conducted with dealers campaigns on electric ranges, adaptor type units, air coolers and in some districts promotion of electric water heaters, I.E.S. lamps, commercial lighting, commercial heating. In farming sections of Oregon, irrigation and other farm equipment have been promoted very successfully. Particularly in irrigation we have had a much larger improvement in our business than in any year previous. As a matter of fact, we consider our promotion with dealers, jobbers and manufacturers to have been very successful.

It might be well to mention that all the sales of ranges, refrigerators and water heaters reported are sold through dealers with the exception of about 200 ranges which were sold by the company in Wyoming and Idaho divisions.

We do not establish a quota for dealer sales and insofar as our own sales are concerned in Wyoming and Idaho, quotas for 1941 have not yet been established.

Speaking generally, we believe that 1941 will be a good year although what definite effects the national defense program will have on the sale of appliances in our territory is a question that we do not feel we are in a position to answer. Much of the territory we serve has not received any material benefits or shared materially in any of the money spent.—*H. E. Farris, Manager, new business and sales.*

Farm electrification section of Puget Sound Power & Light Co. display at Puyallup Fair, seen by 250,000, included a model home laundry, kitchen and farm laboratory developments such as infra-red brooder, small greenhouse, poultry floor scraper

Northwestern Electric

Total sales in the Portland metropolitan area for 1940 amounted to $8,376,000 which was an 18% increase over 1939 at which time $7,073,000 worth of business was had. The appliance business is a large business and will outshine, undoubtedly, many other businesses considered basic and thought to be much larger.

Our business for 1940 has progressed in a most satisfactory manner. We look forward to the new year to continue in the same stride. Appliance sales for the year exceeded our optimistic estimates for 1940 by over 30%. Cooperation we have received from distributors, manufacturers and appliance dealers in the territory in conjunction with Northwestern sales promotion plans for the year has been most gratifying.

Range sales to our customers were 50 per cent greater than the goal we had set. Water heater sales were up 35 per cent and refrigerator sales made new strides. Inasmuch as some of the larger appliances are gradually reaching into lower and more economic brackets, the utilities and other cooperating agencies must consider ways and means of publicizing new services for domestic and farm uses, to reach new markets and fill in gaps that are bound to occur in the general current of marketing events.

In 1941 everything bids for a continued healthy growth.

The events in merchandising included the annual Northwestern Electric Co-newspaper cooking schools held in each town served by the company. We have a monthly publication mailed to all dealers and salesmen, we conduct cooking demonstrations and help on sales calls with our men and conduct sales meetings.

During the year we had two rate reductions effective Jan. 1, 1940 and March 15. In these the average kw.-hr. sold was reduced from 2.5c to approximately 2.1c.

In the commercial end of the business, 1490 kw. was added and industrial load of 239 kw. to present customers with further increases to new customers. For 1941 the estimates are set up for 1,518 kw. commercial and 243 kw. industrial. As to fluorescent lighting, we recommend this where conditions are right. Our sales staff consists of 16 domestic, 5 lighting full-time and 4 part-time, 6 part-time cooking and heating, 1 industrial full-time and 6 part-time men.

In interpretation of the figures in the tables, the saturation is based on Portland only and on a field check taken of 18,375 customers in 1938 and 1939.—*James B. Buman, Manager Residential and Rural Sales.*

Pacific Power & Light

Sales program of Pacific Power & Light Co. in 1940 has been very successful but we have initiated no material changes that would be of general interest. We are assuming that our 1941 program will continue similarly.

One development that might be of interest have been the community cooking schools held under the supervision of our home service advisors and presented to small groups of rural women. This program initiated in 1940 and supervised by Mrs. Audrey Herrington, our home service director, resulted in a total of 44 cooking schools with an aggregate attendance of 1,222.

During the year the outstanding event was the celebration of our anniversary. This took the form of an open house in each of our district offices. Many exhibits of interest to the general public, displayed on our sales floors, met with enthusiastic approval of the public generally. We felt that they were vitally interested in our facilities to serve them and our ability to continue to render dependable service at low rates.

Our dealer coordinative and sales supervisors hold dealer salesmen training meetings. Regular dealer monthly bulletins carry sales hints and suggestions. Beginning in January was our annual adequate wiring promotion which was so successful last year. It was begun in January 1938 to serve as a kick-off for a sustained program of wiring promotion.

The month of January was chosen since it is normally a slack month in the wiring and building trades and also because the huge volume of appliances received as Christmas gifts make the need for convenience outlets more acute. In 1938, 57 dealers reported installation of 655 outlets; in 1939, 64 dealers reported 1,202 outlets and in January 1940, 70 dealers reported 2,119 outlets.

Major industries in this region are flour milling, canning and lumbering and major competing fuels are natural and manufactured gas. During the year there were 343 commercial type evaporative coolers, 28 commercial and 5 industrial air conditioning installations involving refrigeration and 252 home evaporative cooler jobs.

Our sales force of 34 domestic, 13 lighting, cooking and heating, 2 industrial and 9 combination men work on an all-service basis and lighting is not handled as a separate program. On fluorescent lighting, we feel that with proper auxiliaries it is to be recommended where it is best suited.

The defense program may increase prices but spending will likely increase purchasing ability and volume is expected to increase. Therefore we look for a general improvement in 1941 in domestic as well as in industrial load.—*D. B. Leonard, Commercial Manager.*

Portland General Electric

We are rather proud of the fact that dealers sold a total of 6,543 ranges to the customers of Portland General Electric Co. in 1940, an increase of 39% over the year 1939. We are also very much pleased by the sale of 2,960 water heaters by dealers, an increase of 50% over 1939.

In listing the appliances sold in our territory, it should be borne in mind that we have reported the actual con-

Coast Counties Gas & Electric's version of the home lighting display and sales trailer used to stimulate the market for good home lighting equipment. So. Calif. Edison and Calit.-Oregon Power use similar trailers with remarkable results

nection of ranges and water heaters but have not included ranges and water heaters sold on the lines of our competitor, the Northwestern Electric Co. Other appliances such as refrigerators, washing machines, etc. are the best information we can get of the number sold in the territory, both on our lines and lines of Northwestern.

Sales training classes were held for dealer salesmen and large group meetings for dealers and salesmen several times during the year. Our usual cooking schools and other educational programs and increased dealer cooperative efforts were carried on. Home planning service is only furnished in part now by the utility and in part by daily newspapers and the manufacturers.

Territory is urban, agricultural and industrial with the major industries lumber and wood products. The commercial and industrial "promotional" load for 1940 will approximate 750 kw. with an E.A.R. of $27,750 from 1,250,000 kw.-hr. It is estimated that 1941 volume will exceed last year's. We have on the sales staff 5 on domestic, 4 lighting, 1 cooking and heating, 2 industrial and 21 dealer promotion and rural service representatives.

A cross section of retail and non-retail establishments for the 10 months of 1940 indicated an average increase of 6.7% over last year. A substantial increase in industrial load during 1941 is contemplated mainly because of the national defense program.—*A. C. McMicken, General Sales Manager.*

Utah

Utah Power & Light

A new sales policy, under which Utah Power & Light Company discontinued the sale of all major appliances, was put into effect Aug. 26, 1940. Under it we ceased selling ranges, refrigerators, water heaters, washers, ironers, vacuum cleaners and dish washers through our own company stores. Because of this fact, we no longer maintain outside residential salesmen or home service advisers.

Our sales department has been reorganized on a basis to operate under this new set-up by which dealers will make all major appliance sales throughout our territory. We now maintain a staff of 10 sales promotional women and 9 sales promotional men. These people are carrying out a comprehensive program of dealer sales training to give every possible help to dealers throughout our territory but actually do no selling themselves.

Sales figures for last year, therefore, contain company sales up to the time of this new policy and the quotas for 1941 with the exception of air heaters and I.E.S. lamps are all for dealer sales alone. Likewise, the figures for 1939 and 1940 given in the tables do not include a trade-in for company sales but do for dealers. Estimated replacement and saturation figures have been checked with the annual budget.

Serving an urban, agricultural and industrial territory with metal and coal mining as major industries we look forward to a definitely better year in 1941. Outstanding new installations in 1940 included those at Idarado Mining Co., Silverton, Colo., metal mining; Utah Fuel Co., Castle Gate, Utah, coal washing plant.

Results of our lighting program in 1940 were the sale of 17,733 portable lamps by the company and dealers, 3,076.15 kw. of commercial lighting, 818.83 kw. of industrial lighting. We have 14 salesmen and a supervisor on all-service commercial selling and 5 on industrial. In fluorescent lighting we guide the customer in its correct use. Natural gas is the chief competition.—*W. A. Huckins, Sales Manager.*

Provo, Utah

The Department of Utilities, Provo, Utah, started operations in 1940. It does not sell electrical appliances, ranges, or water heaters, all sales going through local dealers. However, it does considerable advertising to promote sales and it conducted an electrical show and cooking school in 1940.

Telluride Power

Although it has no definite set-up for dealer cooperation, Telluride Power Co. at Richfield, Utah, supplied the services of a home demonstrator and economist to assist in teaching customers the operation of the appliances sold. About 60 per cent of the sales in the territory are made by the company.

Uintah Power

This year we are only stocking small appliances at the Uintah Power Co., Roosevelt, Utah, and leaving the major appliances up to dealers with our cooperation. We are turning all of our major appliance sales to the dealers to sell. If they cannot make the sale, we try to help them close. We have sold a few where the customer has insisted that they be sold by the power company and would not buy from anyone else.

This being a rural section, we do not feel that the defense program is going to affect us at all. It can't do much to make conditions worse and it has a possibility of improving them.—*N. E. Lundberg, Secy. and General Manager.*

Washington

Gray's Harbor PUD No. 1

New electric rates adopted by Public Utility District No. 1 of Grays Harbor County, Aberdeen, Wash., were at considerably lower levels than had prevailed previously when the property belonged to the Grays Harbor Railway and Light Co. It was taken over in January of 1940. These rates brought a very sharp spurt in use of electrical appliances. An indication of this rests in the fact that at the time the district took over, there were but 6 customers out of about 9,000 using electric water

An air cooled fair display, fluorescent lighted from a louvered trough, was Southern California Edison's novelty at Pomona Fair (left). Wyvernwood housing development has its own electric kitchen display, a Bureau of P. & L. promotion idea (right)

heaters. Since that time we have installed 150 of the storage tank type.

The PUD commenced operations January 16 of last year. The district does not sell appliances but encourages and cooperates with dealers. It has arranged a special wiring plan by which dealers are able to sell ranges and water heaters installed. A special wiring price to the customer of $25 per range and $8 per water heater has been established. The district has conducted a series of cooking schools in its electric kitchen and furnished the services of a home economist and a repair man.

Range sales last year were four times the volume of the previous year. Water heater sales in 1939 were none as against 170 for 1940. Refrigerator sales last year were approximately twice those of the previous year's volume.

The defense industry should stimulate the lumber business in this area and create increase in employment and purchasing power of our customers which should reflect itself in increased appliance sales.

Industrial customers are primarily plywood manufacturing concerns using district energy exclusively. In 1940 American Plywood Co. with connected load approximately of 1200 hp. and a maximum of 600 kw. was added to the lines. Water heating in dairy houses has been a new agricultural application during the past year. We have no lighting program but do favor fluorescent lighting if properly applied.

Rate reductions began July 1st. Estimated annual reduction to residence customers of $65,000 or 22% was made. New rates are more promotional and provide for water heating service not possible under former rates. A second rate reduction was effected Jan. 1, 1941. It is calculated to give an annual reduction of $30,000. By it the first 50 kw. hr. will be 3½c, 50 at 2½c, 100 at 1½c, 900 at ½c. and all excess at ¾c. The optional rates will provide for the first 300 kw. hr. at $4.50; 900 at ½c, and all excess at ¾c.—*R. W. Beck, Manager.*

Puget Sound P. & L.

Merchandising activity of Puget Sound Power & Light Co. for 1940 was built mainly around the sale of water heaters, with the result that our sales for 1940 showed an increase of 236 water heaters over 1939, with only 22 outside merchandise salesmen in the field as compared to 30 for 1939.

Again the outstanding company merchandise campaign for the year was the "President's Quiz," in which 632 water heaters, 702 ranges, and 291 refrigerators were sold during the period April 1 to June 22.

The campaign was conducted much along the same lines as our 1939 plan with participants qualifying to answer questions relative to our company and facts about the Northwest. Prizes were given to those answering the most questions correctly. The entire program terminated with a final quiz for the winners from our various districts and divisions which was broadcast over local radio stations.

On Feb. 1 we inaugurated an expanded dealer sales program to help promote the sale of electrical appliances by dealers. Twelve men throughout our territory are spending full time with the dealers rendering advisory service in the way of company rates, company service policies, and any other questions which may be troublesome to dealers. Sales training classes were conducted for dealer sales personnel.

Campaigns were set up in outline for dealers with promotional material, advertising outlines, radio spot announcements, and window display contests among the many features. During April, May, and June we conducted the "Electric Range Revue" to help promote the sales of electric ranges. The feature of this campaign was a window display contest with a $25.00 cash award for the best window in each of our seven districts.

In July we promoted an "Electric Roaster" campaign with window displays again as the main feature. During September, October, and November we again had a range campaign for dealers. This one was known as "Alice in Electric Wonderland." A stage presentation and a cooking school was held in all districts outside of Seattle for dealers and their customers.

To further the sale of irrigation systems by dealers we held a running water clinic at the University of Washington on Oct. 24. All pump dealers, distributors, and manufacturers were invited to attend this school. Professors Harris and McMinn of the U. of W. were the main speakers. One hundred and forty people were present. A complete story on pumps and their various operations was presented.

During October, November, and December, a comprehensive light conditioning campaign was conducted. It was called the "American Way." The entire electric industry participated along with our home service, commercial and industrial, farm, and dealer sales representatives, floor salesmen, and local office cashiers, to further the sale of better light.

During the year our commercial and industrial section added 2,487 kw. of improved lighting. An educational and sales program on fluorescent lighting has shown definite results in improved fluorescent lighting installations.

Our home service section has carried on an active program to further develop the acceptance of better lighting standards in the home. Among the outstanding programs conducted by this section were 153 group presentations attended by 12,221 persons. In these presentations were 16 newspaper cooking schools held throughout our territory. Cooking classes have also been held for dealers in their sales rooms and auditoriums. Educational lectures on the science of seeing were presented to women's clubs and school classes.

Discontinued Merchandising

Effective Jan. 1, 1941, Puget Power will discontinue the sale of electrical equipment outside the Seattle area. This is in line with the company's policy of turning electrical appliance and equipment sales over to the dealers whenever customer acceptance warrants and competitive conditions permit.

We shall, however, continue to supply advisory home, commercial, industrial, farm electrification, and dealer cooperative services for the benefit of customers and dealers.

In each of the outside districts we will have a water heating specialist whose duties it shall be to cooperate with all dealers in the sale of electric water heaters.

In 1931 the company discontinued the sale of all so-called small appliances, retaining only ranges, water heaters and refrigerators. Later it became apparent that dealers were in a position to promote profitably the sale of electric refrigerators and emphasis from this item was removed in our own program.

At the beginning of 1940 the company again changed its merchandising program, placing principal sales emphasis on water heating, with an incidental activity on ranges and refrigerators.

During 1940 the top step in the residential commercial lighting and power rates were reduced from 4½ to 3½c. The new all-electric service rates for range, lights and water heater were inaugurated. In the Seattle area, the rate for 370 kw.-hr. is $5.00 and all over 370 kw.-hr. at 7 mills. Outside Seattle the rate inaugurated for all-electric service is $4.50 for the first 250 kw.-hr., 7 mills up to 1000 kw.-hr. and 1 cent for all over 1000 kw.-hr.

The general character of the territory served is 44 per cent urban, 44 per cent agricultural, .35 per cent industrial and 11.65 per cent commercial. Gas is sold in two small communities; it and coal and wood are the major competing fuels.

Commercial air conditioning installations numbered 9 or a total of 26.2 kw. New agricultural load applications included electric motor driven silage conveyor, electric poultry floor scraper,

and a new infra-red brooding set-up. A major new load in 1940 was 1375 kw. for electric shovel and other operations at Mud Mountain Dam.

Prospects for 1941 seem particularly bright in this area. The lumber and allied industries are running at full capacity and the shipbuilding and airplane manufacturers will shortly be at top production. We believe these will all have a very beneficial effect upon electrical merchandise sales for the coming year.—*Patrick Johnson, General Sales Manager.*

Seattle City Light

With a new average revenue per kilowatt hour of $.0211 and exact average kilowatt-hours per account of 1703, an increase of 211 over last year, 1940 has been the best year in the history of the Department of Lighting for the city of Seattle. We anticipate an even more successful year in 1941.

Many factors have contributed to this result. New industries and the expansion of old established commercial accounts have created a large demand for additional electric power. Within the city and immediately beyond its limits, thousands of new homes have been built. The new residence construction has been 100 per cent electric for cooking and water heating.

During the year the Department continued to make new lower electric rates for commercial and residence power consumption. In addition, an optional all-electric rate has further created the desire to use electric cooking and automatic water heating. Under this rate, the entire residence load in the home is on one meter, resulting in considerable capital investment savings in cost of extra metering and wiring for the water heater. Direct result will be 1500 more automatic water heaters than in 1939.

The new low rates met an immediate appreciative response from our customers. The increased use of current in the home for electric water heating purposes and the trend to higher illumination levels in business will eliminate any revenue loss.

Our city has benefited greatly from the government help on constructive work projects. The building of flood control dams, bridges and reclamation efforts used vast amounts of materials and has also given us a new low in unemployment. All these works have a definite relation to our national defense program. The actual construction of military defense equipment and general preparedness program continues to stimulate business for obvious reasons.

Major industries are lumber products, shipping, airplane manufacturing, machinery manufacturing and boat building. In the commercial program a total of 172 completed new lighting installations for an additional commercial lighting load of 257.5 kw. was developed. The Department will continue active lighting programs through its illumination division. Home lighting is also promoted through this department. On fluorescent light, we find it necessary to maintain at least 90 per cent power factor. We feel that fluorescent lighting if properly used will build far higher levels of illumination.

The department participated in the very successful second annual housing show as well as maintaining throughout the year a model electric kitchen located in the permanent exhibit of the Seattle Master Builders Assn.

Thirteen consecutive weeks of cooking schools, capacity attendance, were held in the auditorium of City Light Building. The Department cooperated with a daily newspaper in the sponsoring of weekly cooking schools held in the auditoriums of eight churches.

No major changes in our dealer cooperation were made during the year. The Department continued to subsidize electric range wiring and the wiring and plumbing of an automatic tank water heater. The first seven months of the year, electric range wiring was $20.00 and the wiring and plumbing of an automatic tank was $15.00. These prices were changed on July 1 to $22.50 and $20.00 respectively. Increased sales of merchandise by the small dealer generally in the outlying districts and use of the EHFA plan resulted in the Department using one contact man for this cooperative work.

We continued to assist dealers by instructing their salesmen in water heating and costs of operation of electric equipment through use of bulletins and morning sales meetings. A salesman's Cooks Club was sponsored, wherein dealer salesmen cooked their own meals and participated in a quiz contest, with prizes for best answers.

Among the items of information collected by the real property survey enumerators during a house to house canvass of the 124,774 dwelling units in the city limits of Seattle, were questions regarding lighting, cooking and refrigeration facilities. Preliminary tabulations of the above items have been made. Four of each ten dwelling units use electricity for cooking. Less than three percent of the dwelling units do not have cooking facilities.

Type	Cooking	
	Number	Percent
Total	124,774	100.0
Electric	50,022	40.1
Gas	34,941	28.0
Other	36,226	29.0
None	3,526	2.8
No report	59	0.1

Almost half, 46 percent, of the dwelling units have electric refrigeration. Including the units which have refrigeration facilities, electricity is used for refrigeration in 76.8 percent of the units.

Type	Refrigeration	
	Number	Percent
Total	124,774	100.0
Electric	57,423	46.0
Gas	1,102	0.9
Ice	16,217	13.0
None	49,467	39.6
No report	565	0.5

—*P. C. Spowart, Sales Manager.*

Tacoma

No particular change has been made in the merchandising or dealer set-up of the City of Tacoma Department of Public Utilities, Light Division. It is quite likely that we will use the EHFA financing set-up early in 1941. This utility sells ranges, water heaters and air heaters only. In the water heater quota for 1941, we estimate 365 tanks and 175 side arm heaters will be sold.

Large concentration of troops at nearby Fort Lewis and McChord Field will undoubtedly stimulate appliance sales, especially to officers who live off the cantonment.—*J. Miles Power, Commercial Manager.*

Washington Water Power Co.

Not long ago we checked by actual count in Washington Water Power Co. territory customers' homes the number of electric ranges, water heaters and refrigerators in service so that the saturation figures given in the tables are actual and not estimated. The various promotional events of the year such as our 3-R Campaign have been published in ELECTRICAL WEST from time to time. The latter was outlined in detail in the November issue. Regular dealer meetings and close coordination with dealer activities is maintained through the Inland Empire Electrical Equipment Assn.

We had a $265,000 rate reduction to residential and commercial customers effective April 25, 1940. Our lighting program was very successful and more emphasis will be placed on fluorescent next year. Our policy is that we feel that it is very beneficial to the customer and enables him now to have the necessary foot-candle intensities re-

Washington G & E

Washington Gas & Electric Co. of Tacoma, Wash., serving territory outside that city is establishing a set-up to promote more aggressive dealer cooperation and establishing a home service department. Salesmen of the company will cooperate with the dealers. Quotas for 1941 have not been set. More sales were made in 1940 by dealers, particularly in the new home market. Primarily a lumber section, the lumber market is good as a result of the defense program so business improvement is looked for.

Light conditioning program for five years was launched in Spokane territory when Bob Nelson (standing), president of Inland Empire Electrical Equipment Assn., called on L. R. Wilson and E. Stryker of G-E Lamp Dept. (seated at right) for the story. Art Wegner, F. A. Tool, and J. E. E. Royer, of Washington Water Power Co. were at the head table on this occasion, too

quired for his establishment. Our residential spring lighting program was very successful and this year we will tie-in with the five-year light conditioning program.

There were 100 commercial evaporative cooler installations and 20 air conditioning jobs involving refrigeration, last year. On industrial load, the Electrolytic Plant of Bunker Hill & Sullivan Mining Co. and 15 all-electric kitchens in restaurants upped our load in this category. We anticipate continued stimulated use of electricity in the mining industry and sales increase because of the defense program.—*R. B. McElroy, General Sales Manager.*

Rocky Mountain

Cheyenne

Cheyenne Light, Fuel and Power Co. only does about 25 per cent of the sales in its territory, the rest being done by dealers. It gives general help to dealers through newspaper advertising and promotion and dealer tie-ins in all of its campaigns. The defense program, it feels, will be of material help in that territory.

Colorado Springs

In the city of Colorado Springs, Department of Public Utilities, we do not merchandise but provide merchandise display space in our office and do newspaper advertising on behalf of dealers. We also help by holding a cooking school. Last year this was attended by about 600 people.—*F. H. Wiley, Supt. Electric Division.*

Golden, Colo.

Colorado Central Power Co. of Golden, Colo., does not merchandise, all sales being made by dealers.

However, it does a very active job of promotion.

Logan, Utah

Logan, Utah, city municipal electric power plant does not handle merchandise and makes no particular effort in dealer cooperative work except to sell current and to guarantee adequate service.

Rawlins, Wyo.

Rawlins Electric Co. at Rawlins, Wyo., is a member of the local contractor-dealer Electrical League and cooperates in dealer-contractor advertising, in open-house appliance display, assists wiring contractors with wiring estimates on domestic and commercial wiring problems. It also assists contractor-dealers with consumer installation and apparatus problems. Although it still merchandises a few appliances, it has done less in 1940 than in previous years.

Sheridan County, Wyo.

Sheridan County Electric Co., Wyo., conducts extensive newspaper and radio advertising on dealer cooperative promotional basis at its own expense. Since it does not merchandise any appliances itself, only the figure for range sales is known definitely.

Steamboat Springs, Colo.

The Colorado Utilities Corp. of Steamboat Springs, Colo., does no merchandising itself, except for a few small appliances. The dealers do the merchandising. There has been no set-up for getting a record of sales.

Trinidad, Colo.

Cooperative advertising and promotional assistance through direct contacts is given dealers by the Trinidad Electric Transmission, Railway and Gas Co. of Trinidad, Colo. It does no major appliance merchandising according to R. T. Armstrong, superintendent of power production.

El Paso Electric

El Paso Electric Co. participates actively and helps to support the promotional programs of the Electrical Refrigeration Bureau of El Paso, Evaporative Cooler Dealers' Assn. and the Electrical League of El Paso. In addition, it sponsors various educational meetings.

Serving a territory 80 per cent urban and 20 per cent agricultural, its major industries cotton, copper, and cattle raising, the company anticipates additional load of approximately 3,000 kw. in 1941. A majority of this new load will be for governmental use, however.

Dealer sales showed an increase in 1940, the dealers doing the majority of business in all but ranges and water heaters. Figures in the tables represent resale of trade-in refrigerators only. There were sold 1,072 domestic and 59 evaporative cooler installations, and four commercial air conditioning jobs involving refrigeration.

The company employs 12 domestic, 2 lighting and 6 industrial salesmen and uses the 2 men for promotion of domestic lighting sales. Lighting program consisted of continual promotion of I.E.S. lamps and commercial lighting. On fluorescent lighting, it recommends proper use and fixtures.

Chief competition is natural gas and lower rates in this during 1940 increased competition. Business, however, was 10 per cent better than 1939.—*R. K. Banner, Merchandise Manager.*

Hawaii

Hawaiian Electric

Beginning Jan. 15 of last year, Hawaiian Electric Co. instituted a free wiring and installation plan for ranges and water heaters for dealers. So successful was it that it will be continued in 1941. Under the plan the company reimburses dealers up to $25 per unit for ranges of 6 kw. or more provided the installation is made with No. 6 wire and terminates in a standard range outlet. Water heaters must be of a low-wattage storage tank type with heating units not to exceed 2100 watts. Where range wiring has been already installed,

dealers are allowed a $12.50 reduction which is reimbursed by the Company. On used ranges and water heaters, a similar allowance is made where wiring is necessary.

In announcing the plan, the company called attention to the market opportunities represented by 10,000 ranges and water heaters already in use in Honolulu, to good purchasing power, lower range prices, the desire of the consumers to be modern, and new electric rates permitting operation by families of even modest income.

We will celebrate our 50th anniversary this year and expect actively to promote special monthly campaigns with exhibits and displays to tie in with the anniversary idea.

The reduction in rates amounting to 10% for residential customers which went into effect on Jan. 1, 1940, brought Hawaiian Electric rates to a basis favorably comparable to any in the United States. By comparison of June statistics with those of the Edison Electric Institute U.S. averages, Hawaiian Electric customers use an average of 1,164 kw.-hr. to the U. S. average of 925; the average annual sale was $42.77 to the U. S. average of $36.17; the rate was 3.676 c. to the U. S. average of 3.91c.; the increase in kw.-hr. used was 6.69 per cent to U. S. average 5.6 per cent. There was a decrease in average bills paid of 1.46 per cent and a decrease in average rate charge of 7.54 per cent as against U. S. average 3.9 per cent.

Serving an urban territory, since sugar and pineapple production are more of an industrial than an agricultural operation, the competition is gas. Army and Navy activity is looked for as a stimulant to continued good business in 1941.

The Company has no policy as yet on fluorescent lighting. It employs three commercial lighting, one cooking and heating and two industrial salesmen and ten on domestic. Three of its home service girls promote lighting only.—*C. E. Nolan, Manager Promotion Department.*

British Columbia

B. C. Electric Ry., Vancouver

Not merely defense, but war itself, is affecting business in the territory of British Columbia Electric Railway Co., Ltd. Undoubtedly it has increased our appliance business because unemployment has dropped tremendously in Canada and there are more people working than ever before. Although many of these people are in debt and have to catch up on what we might class as consumer needs, they are starting to buy electrical appliances, and I am confident the business that we will receive in the next few months as a result of the war will be quite considerable.

In explanation of some of the figures in the tables elsewhere, trade-in appliances resold are included. The small overall increase in domestic consumption is due to a policy of eliminating wherever possible the flat rate water heater. The company has 25 domestic, 4 lighting, 1 cooking and heating and 3 power salesmen and during the year quotas were reached or exceeded and more increases are anticipated. New applications in agricultural load included chick brooders, bulb curing, and an electropail for dairy water heating. Sawmills provided a number of new installations. Home lighting is promoted by a separate section with home lighting girls specializing on lighting only. Major competition is sawmill waste and house fuel. The company sells manufactured gas. Industries are largely sawmills and wood working; very little manufacturing and diversified poultry and dairy agricultural business.

Only very minor changes will be made in the merchandising and dealer set-up for 1941.

We have been working for the past four or five years to develop a much greater interest on the part of independent dealers to merchandise electric appliances and to have them understand our problems from a load building angle. The success of our efforts in this direction is proved by the tremendous increase in the volume of business being done by dealers. With a quota last year for the dealers of $1,500,000.00, their sales undoubtedly passed the $2,000,000.00 mark. A better type of dealer has been developed, and there is no doubt whatever that competition among these dealers is making them keener and encouraging them to display their merchandise more effectively than they have ever done before. Our future plans provide for even a closer relationship and understanding with dealers than has ever existed, and we are confident this will result in a still further improvement in our load building efforts.

You will notice there is a considerable increase in most of the units over the estimated sales that were shown in *Electrical Merchandising*. The principal reason for this is the introduction of a Dominion government excise tax of 25% on the manufacturer's selling price of almost all electric and gas appliances, which became effective last Dec. 2, for all shipments sent out from manufacturers from that date. This meant an almost whirlwind buying campaign on the part of many customers who had thought of purchasing a major electric or gas appliance within the next few months, and they made an effort to buy the appliance desired from a dealer who had one in stock and could, therefore, secure it without tax.

Both our own and practically all dealer sales for December showed a very great increase in units and in dollar volume, as a result of the effort to purchase before increased prices came generally into effect. Our own December sales show an approximate increase of 75 percent over December, 1939, and many dealers enjoy almost a similar increase.

War Tax

The effect on sales of the increased price, due to the tax, is hard to predict, but I am confident that the quotas set for 1941 can still be made, as there is a great deal more money in circulation, particularly among the income group where previously the purchase of major appliances was impossible.

All of this, of course, will be subject to stock being available for sale, as it is not possible to have any definite knowledge of whether the manufacturers will be able to fulfill all the requirements, due to a great percentage of their effort being given over to direct war activities.

Both domestic and rural promotional booths were maintained at the annual Canada Pacific Exhibition which had a record attendance of 370,000. The rural booth demonstrated new electrically operated farm equipment, featuring demonstrations of milking apparatus, irrigation farm motors, photo-electric cell cattle spraying, and the pig brooder. Interesting to rural women were the practical farm electric kitchen demonstrations, showing the ease and economy of practical farm cooking and canning.

In the domestic booth a Cinderella Kitchen was the highlight. Professional pantomime actresses performed, first in the 'old' and then in the 'new' kitchen.

Their actions were accompanied by a synchronized sound track. This kitchen modernization skit played to some 11,000 fair-goers. Newest and most interesting addition to the booth was the home lighting salon, staffed by members of the home lighting advisory girls. Public interest centered mainly around the new vision-aid adaptor units.

Our home service department again staged a successful series of homemakers' classes, particularly for new brides. These classes include all phases of home making, including lectures on decoration, furniture arrangement, and home lighting.

A very successful dealer co-operative refrigerator campaign was staged, using the Modern Kitchen Bureau slogan, "Twice the Value at Half the Cost."

Dealers set a new record in refrigerator sales last year, over 2,000 having been installed by the end of August.

A dealer co-operative radio campaign commences in November, sponsored jointly by the B. C. Electric dealer promotion department and the Home Appliance Council of the Electrical Service League, (the refrigerator campaign was also sponsored by this same group).

One of the most interesting experiments was concluded by our own salesrooms. During October we usually stage a special three-day sales event on specially priced table appliances, lamps, and odd lines of major appliances. This year, due to war conditions, we had very little of this type of merchandise available, so substituted with what we termed a "Kitchen Bazaar." During this seven day event we featured various demonstrations in our showrooms under the headings of health centre, tea and coffee centre, and lighting centre. Mixers, waffle irons, juice extractors, hotpads, lamps, and Silex tea and coffee makers were featured by white uniformed demonstrators. It was an inexpensive promotion and, we feel, filled the gap very well.

At the beginning of the year we had a "Merchandise Conclave" jointly staged by the dealer sales department and the Home Appliance Council, which reviewed quotas and sales and installation features on all the popular appliances. In addition to this regular activity, our light and power department has staged a series of special meetings to educate dealers and contractors on the proper use of fluorescent lighting.—*W. C. Mainwaring, General Sales Manager.*

B. C. Electric, Victoria

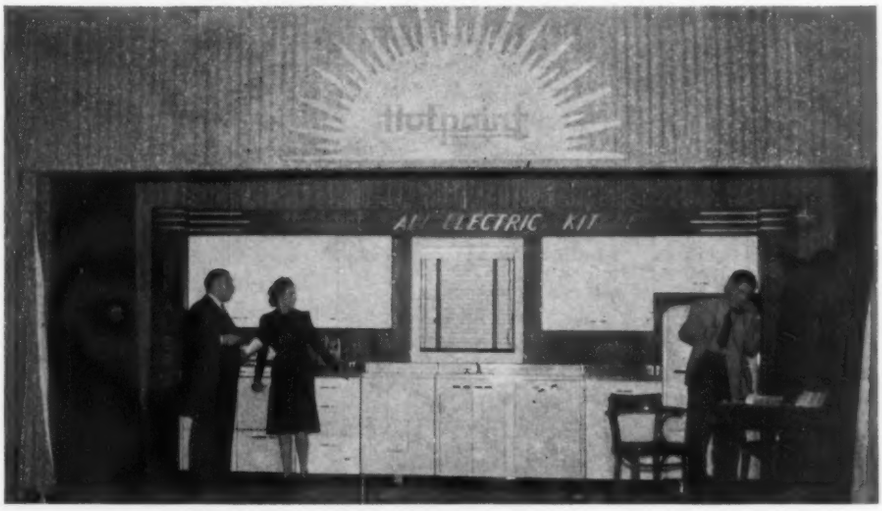
In addition to general conditions as already described in the report from Vancouver, British Columbia Electric Railway Co., at Victoria, has also found Canadian war effort to have increased business in all fields. Added home load was 100 kw. with an estimated revenue of $3,000; commercial 250 kw. with an estimated revenue of $10,000. The quota for 1941 is the same figure.

During the year a homemaker course of four sessions promoting all phases of gas and electric service was conducted. Dealer meetings were also held with emphasis placed on those features of the cooperative plan which materially assists the dealer salesmen.—*M. C. Truman, Asst. Sales Engineer.*

NEXT MONTH—What the leagues, bureaus and societies did and plan to do in market promotion.

It's Appliance Show Time

Manufacturers show new wares in variety of ways; some that have hit West so far



"Speed Sees It Through" kitchen skit in Hotpoint show dramatizes new appeals

Hotpoint

Hotpoint's show, headed by Vice-President Ray W. Turnbull, was a series of dramatized presentations built around the slogan, "Your Place in the Sun in '41 with Hotpoint." Staged for distributors and a few utility representatives, the show was put on at the Empire Hotel, San Francisco, January 6. Attendance was drawn from the entire 11 Western states, because this was the only presentation west of the Rockies.

Among many other attributes was a new presentation method incorporating the use of sound-slide pictures in full color. These natural color photographs added a touch of realism to everything depicted from such a mundane thing as a Calrod water heater unit to a full-course oven-cooked dinner. The various dramatizations introducing the new equipment emphasized new prices which are the lowest in Hotpoint history, improved design, new sales promotion helps, new sales tools and sales plans and a large and intensive consumer advertising program incorporating the successful cartoon technique introduced last year.

Some significant highlights from the various presentations: Included in the laundry equipment line are two electric clothes driers including a new 1600-watt model with a factory list of $99.95. . . . Electric water heaters today offer real profit opportunities for the dealer because this appliance is non-competitive and it has a large market. . . . The 1941 electric ranges at the price levels announced represent outstanding values which the housewife should be quick to appreciate. . . . The new refrigerator has a butter warmer. . . . Shown for the first time was a Hotpoint automatic dishwasher along with a complete line of steel kitchen cabinets. . . . The kitchen cabinets open new opportunities for selling package kitchens and kitchen planning service. . . . Announced also was a new talking picture to accompany the successful feature, "Blame It on Love."

In the party in addition to Turnbull were G. H. Smith, merchandising manager; W. A. Grove, advertising and sales promotion manager; W. R. Shafer, range division manager; A. H. Jaeger, water heater division manager; F. B. Williams, refrigerator division manager; H. E. Warren, home laundry division manager; Charles Griffith, kitchen sales division manager and Mildred Hickman, home economics director.

The three western Hotpoint division managers, Harold Conklin, Los Angeles, Joe Platt, Seattle, and Bert Rowley, Salt Lake, handled the meeting.

Westinghouse

Individualized dealer showings were held by Westinghouse for its 1941 line. Displays were set up at many cities within convenient reach of the dealers throughout the West and an individual personal explanation and showing given to each dealer who attended. The com-

pany's two newest products, a window-sized air conditioner, and the new automatic washer, were also shown in most of the instances.

The appeal of color will be used as a dominant selling theme in the Westinghouse refrigerator line. Trimmings and equipment in the various models have different colors and an attempt will be made to sell these in conformity with the kitchen color scheme.

Anticipating the consumer movement demand for full product information and performance data, Westinghouse has sealed onto each of its appliances a fully informative label this year.

Frigidaire is Tops

Over the road again came the Frigidaire show this year. Tops in showmanship for dramatic presentation of its new models to dealers, Frigidaire returned to this method after stepping down to ordinary hotel room displays last year. Not so elaborate as the '39 model but it was still filled with dramatic skits and crescendo build-ups to climax the spotlighted and sparkling new models.

Cast of the western show troupe was largely western itself. L. A. Clark, advertising and sales planning manager of the appliance division, Frigidaire, from Dayton, Ohio, was in charge but he had with him Fred W. Beecher, zone manager for the Oakland, Los Angeles and Salt Lake territory whose headquarters are San Francisco; W. H. Baldwin, zone manager for the Portland, Seattle, Spokane and Billings zone with headquarters in Seattle; and L. D. Stull, district representative from the Oakland district. Miss Doris Packer, a professional actress, besides appearing in the playlet, contributed an unusual comparison between selling and showmanship. R. G. Hutchinson, regional manager from San Francisco, also accompanied the show to its western meetings.

These began at Salt Lake City, Jan. 6, with B. C. Bintz of W. H. Bintz Co., distributors there, in charge. Next was Los Angeles, Jan. 10 with E. L. Williams, manager, Frigidaire division in that city in charge. In Oakland Jan. 13, R. E. Robertson, manager of the Oakland division presided. Portland, Jan. 15, A. L. Shellworth, Sunset Electric Co. distributor, and Seattle, Jan. 17, J. W. Condon, Jr., Sunset Electric, were in charge; Spokane, Jan. 20, with Alvin L. Jensen, Jensen-Byrd Co., distributors; and Billings, Mont., Jan. 23, C. O. Campbell, Northwestern Auto Supply Co., presided. The show was on domestic equipment only, the commercial comes later, it was announced.

The new Frigidaire refrigerator line, shown by Stull, and the range line by Baldwin, have plenty of style oomph. Breaking away from the accepted lines, both present the market with modern styling of rather daring design.

The range especially with a rakish lamp fitted with fluorescent tubing, slightly off-center, is something that will catch the eye. From the dealer floor, with the fluorescent tube lighted at night as advised in the meeting, it should stop prospects who window shop.

Frigidaire's plays, as usual, are supreme. And this year it introduces two movies designed for consumer audiences in which the sales story is so subtly carried that it would not be surprising to find it featured on many a small town movie house screen.

The refrigerator story, "These Changing Times," uses the "Our Town" technique to contrast living and home equipment of only 20 years ago with the smarter and more efficient 1941 models. The range movie, "Of Men and Menus," has a lot of fun with a group of men who decide to cook a progressive dinner for their wives at a neighborhood party. Their struggles with the cooking bring in, naturally, all of the advantages of the electric range. These moving pictures offer fine entertainment for cooking schools and demonstrations, sales meetings and theatre promotion events.

Dealers cheered when a new extended protection plan was offered to cover service after the expiration of the 5-year warranty. For $10, an additional 4-year warranty can be offered the customer. Since a service job usually involves replacement of the hermetically sealed unit, such a program appealed to dealers as a means of reducing their own expense to keep customers satisfied over many years.

G-E on Six Stages

Six separate stages, the audience moving to each one in turn, were used to present 9 products restyled and improved, to the dealer trade by General Electric Co. in its show. The stages thus separated offered an opportunity to set up a display to which dealers and salesmen could go after the performance and examine the merchandise itself.

Model presentation was given at the exclusive distributor meetings in December, one at San Francisco, the other Salt Lake City. Distributors then took the pattern and applied it locally to their own dealer meetings. Typical was that in San Francisco, held at the Western Furniture Mart, under the auspices of General Electric Supply Co. with George Lloyd in charge.

To highspot the special new things of the year, little skits were sometimes used. While Paul Wilmore, for instance, was explaining the quality and beauty of the refrigerator, two pretty young ladies impersonated these attributes. When he came to the description of the new butter conditioner, they came out trying to butter a piece of bread with butter far too hard under normal refrigeration. With the conditioned butter, Wilmore was able to show them how easy butter spreads.

Tom Dorbin of the home laundry section likewise contrasted the beauty of the old and new lines by means of the two girls, one dressed extremely plainly, the other in elegant costume. Although the new automatic was announced, it was not shown at the dealer meeting. It will also have a soft water conditioner and was promised to the trade in 90 days after a 30 to 60-day test in Hartford, Conn.

Pretty soft—the girls pretty and the butter soft, thanks to G-E's new refrigerator gadget, a butter conditioner

Howard Oliphant in presenting the new ranges, featuring the new Stratoliner, had assistance from the two young ladies as hostesses. Speed, streamlined appearance, quality of the new range line was compared to the ultimate in air transportation. For water heaters, the new crescent-shaped unit of 1500 watts for the lower unit of a two-unit water heater was explained.

Packaged kitchen unit sections promised much in the expanding kitchen market. Leonard Oppenheim displayed three centers, a refrigeration storage center, a range center, and a sink preparation center, each of which can be purchased as a unit. Increased profit margins, a variety of sizes and seven packaged kitchens to sell from $265 to $485.50, as well as improvements in the dish washer and the disposal unit were shown.

For refrigerator dealers, a new unit cabinet that fits on top of a standard 6-ft. refrigerator aroused a lot of enthusiasm.

Walter Bowen, in charge of the vacuum and radio department, had Herman Rose, California representative, show the new vacuum cleaners. Rose, witty and sophisticated, explained that since the vacuum cleaner market was one of combination deals, G-E had a good many to offer also.

For radio, T. F. Hall of Bridgeport, spoke of the gradual transition to frequency modulation and then showed new models to be added to the table model line immediately.

Norge Distributors

Norge displayed its new line to distributors at meetings in Detroit late in December. Following this, individual distributors made showings in their own regions to dealer groups. In some cases, as did Leo J. Meyberg Co., a special meeting of the entire distributors' organization was given the picture first.

The Meyberg organization annually meet for this purpose. This time 80 members of it from both northern and southern California houses met at Del Monte for a two-day business session. At it not only Norge but Bendix, RCA, and the company's newest venture, the Congoleum-Nairne line were introduced. Al Meyer, president, and Manfred Meyberg, vice president of the company, were present. Likewise was E. T. Cunningham, former president of RCA Mfg. Co. and now retired.

Frank Burns, vice president of RCA Mfg. Co., presented the new RCA sales picture. M. G. O'Hara, vice president in charge of sales for Norge division of Borg-Warner Corp., and Lee Cox, west coast representative, presented the new "nightwatch" Norge for 1941.

R. C. Cameron, west coast division manager for Bendix, showed its new models. Leroy Bennett, some years ago prominent appliance distributor, was announced as the new manager of the Congoleum-Nairne department of the Meyberg Co. Other notables present were E. J. Rising, west coast manager of RCA, and Ray Murphy, west coast manager, Westinghouse Lamp Co.

Following the presentation of the new line and an annual banquet, department managers' conference was held on the Saturday morning following.

● A Major Dealer Development Department has been announced by Easy Washing Machine Corp. as an adjunct to its 1941 sales and promotional program. Its purpose is to develop markets, insure dealers adequate territory in which to operate and adequate coverage of each locality. Its functions will be largely those of planning and cooperation with department stores, furniture stores and other key outlets.

Appliance Council

Year's program in B. C. outlined despite war

Electrical distributors and others interested in the co-operative merchandising campaign program for electrical appliances and radio for Vancouver met at a luncheon in the Georgia Hotel on January 20. Arranged by the Home Appliance Council of the Electrical Service League, details of the program for 1941 were presented and the financial budget submitted. H. C. Darroch, chairman, is with Canadian General Electric Co.

The lighting campaign, which will be largely directed by the League under the supervision of R. Hall, manager, got under way by mid-January. The merchandising conclave, which has annually become an event of increasing interest to all branches of the electrical trade, will be held on Feb. 20 and 21 with Harold Merilees, promotional executive, B. C. Electric, handling the arrangements.

E. Henderson of Western Agencies, chairman of the refrigeration committee of the Home Appliance Council, has selected April for the refrigeration promotional effort while ranges will be featured in May, this committee being headed by C. Moffatt of Moffat's Ltd.

Laundry equipment will be played up in two drives, one to be held during the spring and one the fall. E. Cooper, McLennan, McFeely & Prior Ltd., is chairman of this section of the Home Appliance Council and F. Boyle, of RCA Victor is heading up the radio division which will present its campaign in November. Small appliances will be promoted by a committee under the chairmanship of G. N. Gardner of the Canadian Westinghouse Co. This campaign has been arranged for December.

James Lightbody, publicity manager B. C. Electric Railway Co., will this year co-operate with each of the campaign committees instead of setting up a separate publicity and advertising committee for each drive.

● A Ban on Import of electric and gas appliances from the United States, went into effect Dec. 2 in Canada. Simultaneously a 25% excise tax on all such appliances as are made in Canada has resulted in about 25% increase in list price of appliances.

● Electro Dealer—the dealers' sales promotion publication of Utah Power and Light Co., grew in size beginning with its January number.

● Utah Power & Light Co. won the award and silver plaque given by Reddy Kilowatt for the most popular, simplified, best-illustrated, and most human-interest annual report for a utility company. Judge for the contest was M. S. Rukeyser, economics writer for Hearst newspapers. Reddy Kilowatt was used effectively in humanizing and dramatizing the economic facts concerning this company's operations.

Campaigns

Western Radio & Appliance Trade dinner, Wed. Feb. 5, the central appliance attraction of the annual spring market at the Western Merchandise Mart — Chairman Harry A. Strong, executive vice president, Servel Inc. Toastmaster, A. F. Rice, general manager, Occidental Stove Co. and guest speakers J. J. Nance, vice president and general sales manager, Easy Washing Machine Corp., subject "Selling in a Seller's Market", and C. M. Snyder, assistant manager appliance and merchandise department, General Electric Co., subject "Look Ahead."

Modern Kitchen Bureau's "He-Man Cook" electric range campaign for spring will tie in "Famous Recipes by Famous Men", art work and posters for window displays by James Montgomery Flagg, invitations for a spring showing of ranges and other promotional materials. Magazine advertising will feature a catchy slogan "The Switch is to Switches Again."

"Third Step" sale of electric water heaters in February and March will offer range users as incentive in Southern California Edison territory, in return for the old water heater, a choice of a $24.50 Thermador electric speed griddle with individual table or a $23.75 Universal electric mixer. Dealers may extend these same trade-in allowances.

Washington Water Power Co. has a laundry equipment campaign in February and in March ranges and water heaters. Campaigns are designed for both company and dealers.

Nevada-California Electric Corp. is featuring washers and ironers in February, in March, refrigerators. Imperial County Fair comes in March.

Utah Power & Light Co. territory, also Western Colorado Power, during February, stock clearance, sun lamps, store lighting. During March, space heaters, ranges, water heaters, store lighting.

Pacific Gas and Electric Co.—March and April electric range and water heater campaigns. Direct mail program to promote kitchen modernization being mailed to 80,000 customers in three mailings. Recent rate reduction is tied in. Booklets urge customers to call on appliance dealers.

Bureau of Radio and Electrical Appliances of San Diego—table appliance promotion in February, March, refrigeration promotion.

Pacific Power & Light Co.—January campaign on convenience outlets; February and March, home laundry.

B. C. Electric Railway Co., Vancouver—Merchandise conclave Feb. 20-21 to outline programs for the year.

ELECTRICAL WEST

McGRAW-HILL COMPANY OF CALIFORNIA
68 POST ST. SAN FRANCISCO

The all-industry magazine of progress, established 1887 and incorporating the "Electrical Journal," "Journal of Electricity, Power & Gas" and "Journal of Electricity." Contents Copyrighted

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Annual Roundup

FOR 22 years now the editors of ELECTRICAL WEST have been compiling this annual roundup of electrical industry progress. Although the primary purpose has been to provide a statistical handbook that would be a review of past accomplishments and a gage to the future, the editors have hoped that this annual undertaking has had a deeper significance. It has been their wish that this study would serve to inculcate in the individual a sense of security in his job, a feeling of pride in his industry and an understanding of the various intra-industry relationships.

In the pages of this issue the reader will find figures to prove that our industry is based on a solid foundation of performance. There are others which show that the industry's growth is assured. Facts presented point to future opportunities. The reviews of programs delineate engineering trends, reveal new markets, show where dealers and distributors may increase their sales by cooperative promotion. Outlined also are measures the industry is taking to aid in the national defense activity.

To the corps of voluntary helpers who have made the issue possible, the editors express their sincere thanks and appreciation. More than 150 men in the utilities, the cooperative associations and other branches of the industry cooperated in producing the data in these pages. The editors simply assembled, edited and interpreted. For what purpose? So that you, you and you, might read and learn and profit.

State of Emergency

A FORTY-NINTH state has joined the Union. Its name—the State of Emergency. This new state is going to permeate the life of every individual in all of the other 48 commonwealths that make up the U.S.A. Every person in the electrical business will feel its impact whether he realizes it or not. It brings with it new and added individual and group responsibilities. Before the national and international affairs that created this State of Emergency settle down again, we will travel a difficult road, beset with trying circumstances. As electrical people, here are some things we must recognize:

Our industry has got to work longer and harder and more intelligently than ever before. It must be unified in the universal program to make America so strong that our liberties and our way of life may be preserved. Number one job is to arm the United States and the other democracies on such a scale as to make the world once again free and to keep it that way. That is the primary job, the one to which every effort must be bent, without quibbling, without carping, and with all of the sacrifices that may be demanded. Our national defense is our national insurance, and we almost let our policies lapse. In typical American fashion—Emergency fashion—we have set out realistically, intensively and passionately to make amends. That the armament job will be accomplished eventually there is no reasonable doubt.

However, the impact of this State of Emergency goes beyond national defense. While undertaking this program of armament, we must preserve our normal national economy, our constitutional representative form of government, our system of free enterprise and individual initiative. We must continue to produce, as long as possible, the goods and services to meet the normal needs of the American people, and this without undue price increases or inflationary pyrotechnics. Complicated? Well the accomplishment of these aims is as simple as a Sunday School picnic compared to the final task.

While living in this State of Emergency, we must strive to make ourselves secure against the unknown difficulties that will come with the return of peace. Gone then will be the effects of the national defense stimulant. Men and industries will be demobilized. So we must think and plan for the future. We must intensify our research so that new goods and processes will be ready to take the place of guns and tanks on the assembly lines.

Only in this way can we preserve our institutions and our future.

There is work to be done as long as this State of Emergency persists. We know full well that the electrical industry and its people will not shirk their share.

Wage Increases

INCREASE in wage scale just granted by San Francisco contractors, and which has initiated a wave of demands for increases in electricians' wages throughout that state, can be charged up to the cost-plus-fee policy of the Navy in the award of defense contracts. General contractors, eager for skilled electricians, have offered rates above the scale. Men have reasoned that if the general contractors were getting theirs regardless of cost, they might as well get theirs too while the getting was good. All the other crafts are following suit. The defense program is starting up in cost even before it is fairly well started.

For those on defense projects this may be rational but it is going to be bad for the home building and small repair and installation work. After defense work stops that is what will have to support electricians and contractors and pay for the defense program. Why strangle the bread and butter business that already is half smothered by private bootlegging of wiring?

Gold Fish's Privacy

IF ANY doubt ever existed over the truth of the old adage that a public utility "has about as much privacy as a goldfish," it will be dispelled by new rulings issued by the SEC. That highly inquisitive governmental agency now requires that utility holding companies report in detail all "public relations" information for parent company and all subsidiaries. If an individual or a small business organization were required to reveal the same information about their affairs, the resultant cry would stir the corpses of long dead Congressmen. For instance, most people would be tempted to tell a government investigator it was "none of his damned business" how much they paid for dues to any "social, educational, professional, trade or other similar organization." Under the new SEC requirements, the utilities must report such data "whether for the account of such company or of any of its officers or employees."

Required in the future as a matter of public record will be tabulations of expenditures showing "in money, time, materials, supplies or service to or for the account of any political party, committee or agency thereof, citizens' or taxpayers' group, educational institution, organized charity, candidate for public office, holder of any office in a political party, or public relations counsel (or any officer or employee acting as such)." Stripped of legal verbiage this ruling requires reports on virtually "everything." But in case there might be any omissions, there must be another tabulation listing by months "all payments or contributions to newspaper press associations, newspapers, magazines, or other publications, subdivided to show payments for institutional advertising, for other advertising, and for purposes other than advertising." Not only would most businessmen resent the implications of these requirements, but they would likely vigorously object to them on the ground that they invaded constitutional rights.

But then most businesses are not in the goldfish bowl—yet.

Tragedy in the Zoo

DEAD, according to our London contemporary—the *Electrical Review*—is the only electric eel in the London Zoo. While failing to state whether or not the eel was a victim of a bombing raid that damaged the zoo, the paper does report the autopsy. Examination showed that death was due to a piece of coiled wire with a sharp, straight end which had perforated the stomach. "How the animal got hold of this is a mystery—one flippant suggestion was that he was trying to wire his electrical supply," the paper says. We would rather think that out of patriotism, old *Electrophorus electricus* was simply providing himself with emergency facilities.

IT IS no paradox, but a proved fact, that the profitable industries of this country pay the highest wages and sell their products at the lowest prices. Where profits are low or non-existent, prices fail to follow the downward trend, and the earnings of labor, even if the hourly rate be high, are low by reason of shortened hours. . . . Profits are a badge of merit, a measure of intelligent management, a direct addition to the national purchasing power and to Government revenues, an invitation and inducement to new invention and new enterprise, to the pioneering of new economic frontiers. Without profits our enterprise system would gradually cease to be, and with it would go our standard of living and the social advances of the last decade.—Philip D. Reed, chairman of the board, General Electric Co.

UNIVERSAL RANGES- backed by national promotion- are the profit line for '41!

2 MAGIC EYE OVEN CONTROL, new illuminated dial automatically switches from preheat to bake.

4 SELECT-A-TROL permits setting UNIVERSAL Automatic Timer for oven, outlet, or economy cooker.

3 SUPERHEAT UNITS give amazingly fast surface cooking, cut current costs to the bone.

5 SERV-A-DRAWER warming compartment is thermostatically controlled.

. . . because ONLY UNIVERSAL has the 5 "star" selling features that build real sales volume

Here's the sales sensation of the electric range business for '41—the new UNIVERSAL. To your customers it offers quicker, easier, more economical cooking than ever before, wtih results uniformly better. To you, as a UNIVERSAL dealer, it offers bigger profits from more and easier sales! Write or wire today for information about the UNIVERSAL Ranges for '41. Learn how this fast-selling line — backed by powerful national advertising — can help make this the best range you've ever had!

NEW FOR '41 — the UNIVERSAL WATER HEATER

A fully automatic electric water heater in the modern, square design. Write for particulars about this new companion to UNIVERSAL Electric Ranges!

UNIVERSAL

THE TRADE MARK KNOWN IN EVERY HOME

LANDERS, FRARY & CLARK ☆ New Britain, Conn.

PRINT IN BINDING

ELECTRICAL WEST Sales Guide

Why yearn for a PUSH-OVER?

Some selling is a push-over. The customer comes in, mind already made up, and pushes over a "buy" without any effort on your part. Even cheats you out of some of the satisfactin of a "sale." That's no more fun than catching carp.

Real zest comes when the odds aren't all on your side. Who wants a push-over!

Electric Water Heater sales are a real satisfaction for that reason. Lots easier to make these days of lower rates and electrical mindedness, but still hard enough to exercise your best salesmanship and give you a kind of thrill to close.

Cost of competitive fuel often looks like a pretty big hurdle. Or maybe you think a water heater hasn't much "sex appeal," glamor, gadget story or umph.

But to offset these you have several "exclusives" with **electric** water heating that no other means of heating water can boast. These "exclusives" are that electric water heating is **SAFE, CLEAN** and **CAREFREE,** more so by far than competition.

Success—and that special satisfaction—hinges on you making these **exclusives** stack up high against other ways to heat water.

"The American public is tired of being shoved around," said Paul Cherrington before the Boston Sales Managers Club, and it insulates itself against salestalk. To penetrate this insulation, he bids salesmen

"Don't lie to them!
"Don't brag to them!
"Don't crowd them!"

Pretty good advice and easy to follow in electric water heater salesmanship. Instead, picture to prospects the luxury of plenty of hot water for every need. That electric water heating is **SAFE, CLEAN** and **CAREFREE** is neither lie nor boast, it's gospel truth.

And if you picture these virtues vividly enough, you won't need to crowd, they will buy just as soon as they can. Your effort won't be wasted. If yours is the most vivid, most-true-to-life picture of what plenty of good hot water, **SAFE, CLEAN** and **CAREFREE,** means to them you are most likely to get the order when it percolates.

Walt Disney Productions
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ELECTRIC WATER HEATERS

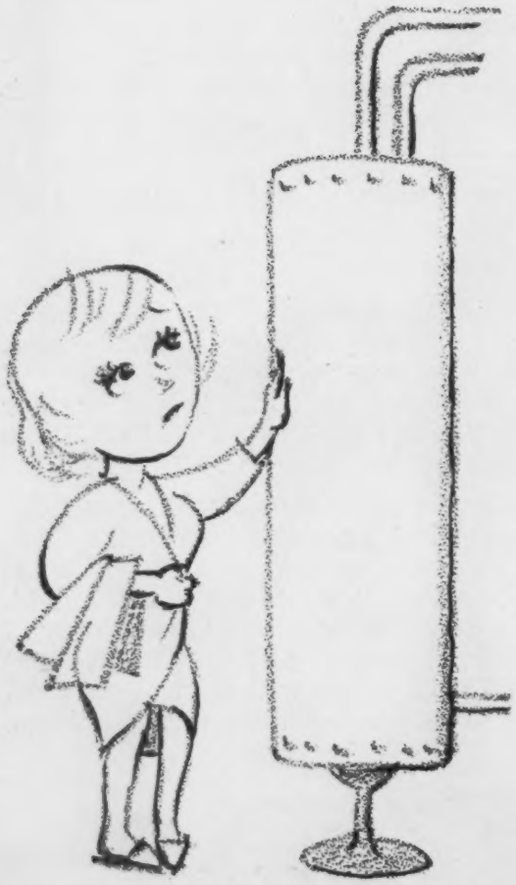
FEBRUARY 1941

Electric Water Heater

Selling is fun

WHEN YOU KNOW YOUR STUFF!

"What do you do for Hot Water?"



One of the best water heater salesmen in the Northwest used that question to open conversation on the subject. He used it when he had closed a range sale or even at the beginning of it. With that question he had made the highest percentage of water heater sales to ranges in the city.

Everyone heats water in some way. When they tell you how it gives you an opportunity to compare the convenience, cleanliness, safety, healthfulness and long life of the electric to the old method used. The prime importance of hot water service to health and household cleanliness is told next.

In the close offer to combine the heater and the range and bring both conveniences to the home at once.

Even to those already owning a range, the question, this chap found, gave him an opening to talk electric water heating. It gave him a clue as to their satisfaction or dissatisfaction with their old method.

It's an easy and natural question. It can be said offhand without "setting" the sales resistance.

Try it.

Then when you've made a break with it, follow with a sincere and honest suggestion of how electric hot water can make life easier for them.

Remember, don't lie to them, don't brag to them, don't crowd them." Just tell them these advantages and "exclusives" of the electric way to heat water listed in the next column.

Carefree—Nothing to turn on or off but the faucet. Once installed you can forget it. Water always hot, yet won't overheat. Even if not used, water will remain hot for three days or more. Leave the house even with the children there alone and your mind can be at ease; there are no switches or valves for curious hands to touch.

Clean—Clean as electric light and sunshine. Cleanest fuel on earth—ashes, soot, odor, smoke all eliminated. Clean air means less cleaning of wall paper and paint, less housework. Heater itself as easy to keep clean as a plate.

Safe—Does away with open flames, possibility of leaky pipes or faulty flues. Approved by Underwriters it's as good an investment as fire insurance. Water never gets dangerously hot.

Healthful—Cleanliness is next to Godliness. Dependable hot water service makes bathing convenient, pleasant. Hot water sterilizes dishes, clothes. It is indispensable in time of sickness. Hot water is a beauty aid too.

Always ready—Day or night it's ready. No waiting or tank patting. Requires no attention at all.

Cool in summer—Like a big thermos bottle, the heat is all sealed in. The tank is moisture-, vermin-, rot-proof, it keeps the heat at work inside. It's cool to the touch.

Quiet—No moving parts, no roar, cannot generate steam to pound the pipes.

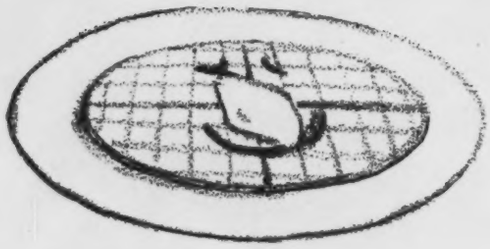
Install anywhere—Even in a closet, or corner without flue or air supply. Heating units give years of uninterrupted service and the thermostats are simple and positive as well as accurate. Monel or bronze tanks are guaranteed for 20 years or so.

Efficient and economical—with present low rates and the 100% utilization of heat. Gives all of its heat to the water, none goes up a flue. No waste in incomplete combustion. Remains efficient throughout its life. Abundant future fuel supply assured in electricity.

and We'd like You to Succeed at it!

PUGET SOUND POWER & LIGHT CO. · WASHINGTON WATER POWER CO. · PORTLAND GENERAL ELECTRIC CO. · CALIFORNIA OREGON POWER CO. · UTAH POWER & LIGHT CO. · IDAHO POWER CO. · THE MONTANA POWER CO. · ROCKY MOUNTAIN ELECTRICAL LEAGUE

"Stuff" to Know



How Users Can Help

Here's an idea from Modern Kitchen Bureau letters from successful water heating salesmen. If you have not used it, you'll find it mighty simple and effective:

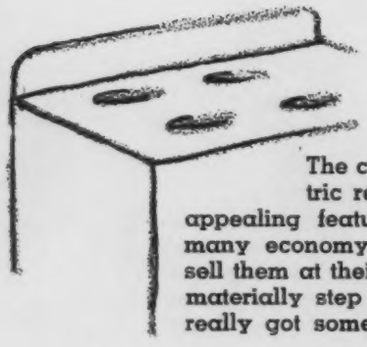
"I learned my most helpful tool in water heater selling from my first call. I was calling on Mrs. T. and after having discussed the many advantages of a ready supply of hot water and of the electric heater in particular, Mrs. T. asked me whether or not there were any installations in town. I mentioned several and suggested that we call a few people on the phone and get some actual information from first hand users. Mrs. T. picked out a user from my list and I called her on the telephone.

"After identifying myself, I asked her how she liked her heater, and her reply was so enthusiastic that I asked her to talk to Mrs. T., with whom she was well acquainted. She said she would be glad to.

"Mrs. T. took the phone and they talked for fifteen minutes. When she finally hung up, I had the contract ready and passed it to her without saying a word. She read it over and signed.

"I have used this method several times since and although they haven't all been quite as easy as Mrs. T. to close, I have had very good results from it as a whole. I have found that the user of an electric water heater is the best sales argument I can use to close a sale."

Other good sales tools to use are the new water heating rates, photostats of users' bills, and to put some visual appeal into it, the visualizer books or cut-away display models of water heaters that are available from the manufacturer of the make you are selling.



Keep Yourself In Range---

The cooking well on the electric range is one of its most appealing features. Read up on its many economy uses and be able to sell them at their full worth. They will materially step up your sale. You've really got something there!

It's always Waffle Season

"How's business?" "Waffle!" That may be a bad pun but it's a good selling hunch. For waffles are always in season. Bet you hadn't given a thought to the number of things you —or customers—could do with a waffle iron, a new automatic one anyway.

There are recipes for breakfast, luncheon, supper—for main course or dessert. And they are ideal for snacks, after the show or late parties, for buffet breakfasts, luncheons, teas or dinners.

Special waffle flours and batters are available and advertised, quick to mix and serve. With the new automatic waffle bakers every one is turned out perfectly.

So in talking them up to prospects, remember to tell some of these advantages—make the mouth water for this indispensible appliance. Be sure to say that a modern automatic waffle iron will—

(1) Give pleasure with its delicious waffles because of its improved performance. (2) Enhance the reputation as a clever hostess. (3) Bring variety to meals with tasteful new recipes. (4) Save tempers because waffles won't burn or stick. (5) Enable her to cook at the table, remain with her guests or family. (6) Save steps to the kitchen. (7) Cook just enough for the occasion, without waste. (8) Provide cooler cooking in the summer. (9) Add beauty and charm to the house because of modern styling. (10) Last a lifetime, if it's a quality make.

The number of waffle shops throughout the country attest to the popularity of waffles. That's a good market for you to cultivate.

"Stuff" to do

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What Make Of Refrigerator Do You Prefer?

MORE PEOPLE PREFER A GENERAL ELECTRIC THAN ANY OTHER REFRIGERATOR . . .

According to recent national magazine surveys among refrigerator owners and prospective buyers, over 50% more people prefer General Electric than any other make.

G-E is tops in preference *because it's tops in performance* . . . . and top performance means greater customer satisfaction, minimum service calls, and greater profit.

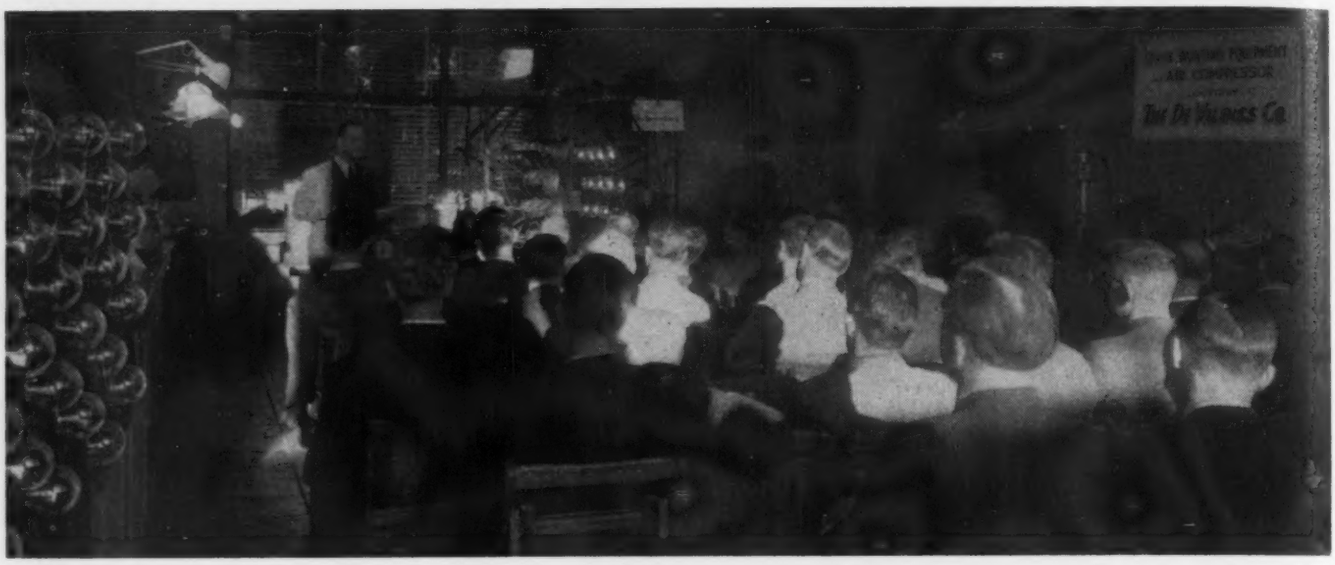
It's G-E for Me!

News!

A beautiful big new SEVEN CU. FT. G-E for the price of last year's "Six." Here's refrigerator news that's making the headlines! In addition, new G-E models have Perfected Conditioned Air, New Butter Conditioner, New Dry Storage Drawer, New All-White Textolite Door Strips, along with many other innovations.

Research keeps General Electric years ahead!

GENERAL ELECTRIC



Infra-Red

Contractor and manufacturers stage a cooperative demonstration for industrialists

That infra-red is not a new kind of salad or some form of communism—but is the most up-to-the-minute method of drying, dehydrating, baking of enamels, etc., by radiant energy was well demonstrated to an attendance of more than 500 industrialists at the infra-red clinic recently put on at Los Angeles.

Quality Electric Co., Ltd., and Machinists Tool and Supply Co. of that city, distributors of the infra-red equipment of the Fostoria Pressed Steel Corp., conducted a four-day clinic at the plant of the former afternoons and evenings of Nov. 26 to 29.

Also cooperating actively in the institute were the Southern California Edison Co., Bureau of Power and Light, Marwood, Ltd., and a number of paint manufacturers, including Sherwin-Williams, DuPont, Nason, W. P. Fuller, Glidden, Paraffine Companies and Arco.

Ray N. Green, engineer for the Fostoria company conducted the clinic. Industrialists had been invited to bring their baking, drying and dehydration problems. Paint chemists had recommendations as to the best materials to use for various processes. An adjustable tunnel was provided, through which the work was passed.

The Conveyor Company furnished a variable speed conveyor by means of which the correct time for any process could be determined accurately. The DeVilbiss Co. provided compressor, spray guns, and necessary equipment for experimental work.

A wide range of applications of radiant energy were presented—from dehydrating dog biscuit to the baking of finish on airplanes and the stimulation of citrus growth.

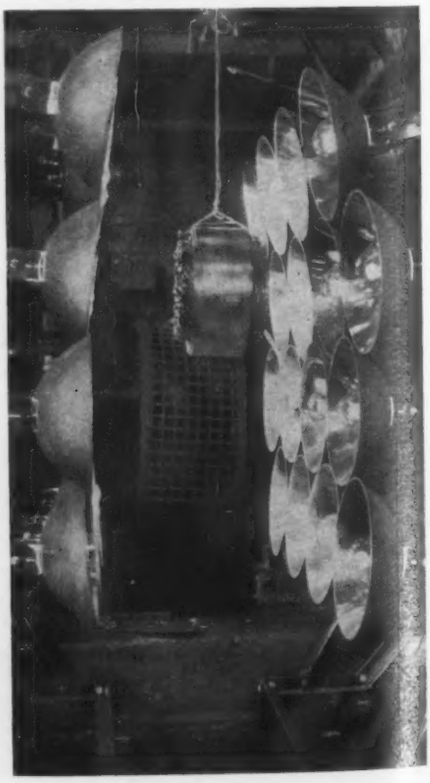
Quality Electric itself is successfully using this method of baking varnish on motor rewinds. Where ordinarily 12 to 14 hr. baking time are required with the conventional oven it can be done satisfactorily with infra-red in from 2½ to 3 hr.

Another interesting development presented to the clinic was the new Leray lamp for killing bugs, moth larvae, fungus, scale and micro-organisms. Rays of this lamp are higher in the spectrum than the near infra-red and are very effective in germicidal application.

The experimental equipment will be kept available at Quality Electric for the use of industrials, paint manufacturers and others.

● WITH A VISIT TO A 100-FT. CANDLE office lighting installation for the practical side and to a spectacular woodland fountain and waterfall illumination on the romantic side, the San Francisco Bay Cities Section, IES, made the Jan. 22 meeting an East Bay visit. After dinner at the Women's City Club, chairman K. K. Knopf turned the group over to Sam Hazleton, illuminating engineer, G-E Lamp Dept., who escorted the entire group through the 100-ft. candle lighted offices of the lamp company in Oakland. Lamp Dept. headquarters for the Pacific Division have recently been moved to the factory and warehouse where these new lighting installations were made as models. Following the Lamp Dept. visit, a quick trip was taken to Woodminster amphitheatre, cascade and electric fountain in Joaquin Miller Park where Westinghouse and Cutler-Hammer have installed fountain and waterfall illumination on constantly-changing color and water-pattern cycles.

One of the four day clinic classes at Quality Electric during a lecture demonstration (above) and a motor stator being baked by infra-red heat. Quality Electric is experimenting with this method for the baking of varnish on motor rewinds. So far it looks promising



WESTINGHOUSE supplies the answer

On all Westinghouse 100-watt fluorescent fixtures, reflectors are completely detachable from the hood by means of a simplified thumb-locking arrangement.

WESTINGHOUSE
IN COMPLIANCE WITH SPECIFICATIONS UNDER APPROVED INSPECTION PROCEDURE OF RLM STANDARDS INSTITUTE CERTIFIED BY ELECTRICAL TESTING LABORATORIES

Two-piece Construction Speeds Up Installation of Fluorescent Units

Westinghouse 100-watt fluorescent lighting fixtures not only provide higher levels of industrial illumination, but save valuable time during installation and maintenance.

With lamps removed, an easy quarter turn of two tension-locked thumb latches releases the reflector from the hood, making auxiliary equipment readily accessible. This time-saver, an exclusive locking system, permits attaching and removing the reflector without disturbing line connections. All wiring, fluorescent ballasts, starters and lamp sockets are mounted in the hood.

Four 100-watt, porcelain-enameled reflector types fit the one 100-watt fluorescent hood. The RLM unit shown above is available with or without diffuser openings in the top of the reflector for ceiling illumination. Similarly, two units with open reflector ends are also available.

Call your nearest Westinghouse Lighting Distributor, or write Westinghouse Electric & Manufacturing Co., Edgewater Park, Cleveland, Ohio, for Catalog Section 61-152.

117 Westinghouse Electric Supply Company Offices and Independent Lighting Distributors provide local stocks and service.

Westinghouse Lighting Equipment

Moving North

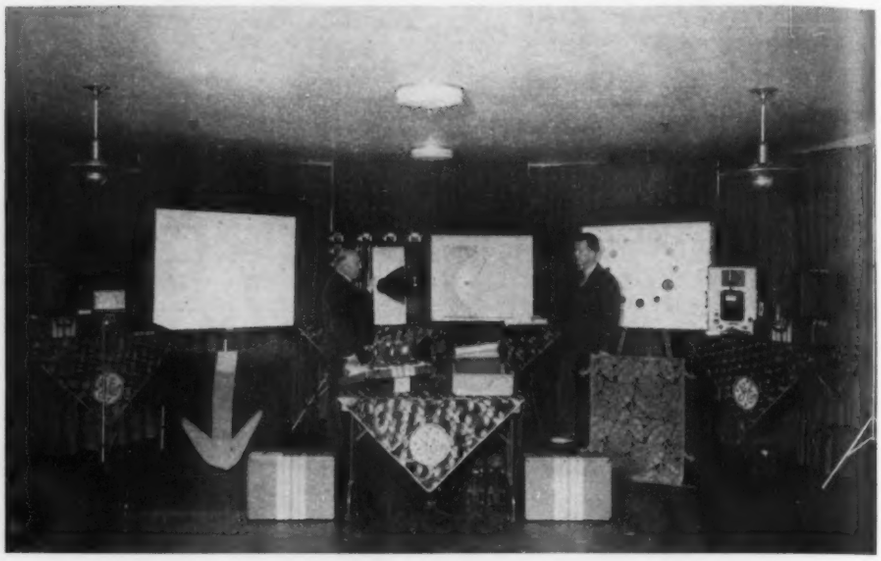
G-E Institute on wheels goes to Northwest this month

Already started on its tour of the West with initial meetings in Los Angeles and San Bernardino during the last four days of January, the General Electric traveling Lighting Institute swings into northern California, Oregon and Washington during February. Under the direction of James M. Ketch and making use of the services of Alston Rodgers, Sam Hazleton and Walter Potter, Lamp dept. engineers in Los Angeles, San Francisco and Portland respectively, more of the itinerary is now announced.

Beginning Feb. 3 at the Civic Auditorium, Montgomery Theatre, at San Jose, will be an all-day lighting lecture conference and an evening merchandising meeting. For three days the Institute will be at P G and E Co. auditorium, 245 Market St., San Francisco. On Feb. 5 will be an evening meeting for electrical contractors on fluorescent lighting. Feb. 6 is an all-day "present day lighting practices" conference, Feb. 7, an afternoon "school lighting practices" conference and that evening a lamp agents meeting on "light conditioning and new developments in lamps and lighting."

On Feb. 10 the all-day and evening conference and merchandising meeting will be held at Fresno, San Joaquin Power auditorium. On Feb. 12 the same will be held at Sacramento at the Tuesday Clubhouse and on Feb. 14 at Hotel Oak's main dining room, Chico.

Jumping then to Oregon the all-day conference and merchandising session will be given at Holly Theater, Medford, Feb. 17. Portland, at Public Service Bldg. auditorium, on Feb. 20 and 21 will have the expanded program as will Seattle on Feb. 24 and 25, at Moore theater. Spokane will have the one day and evening meeting on the 27th, according to L. R. Wilson, manager North Pacific Div.



A sample of Nela park and its lighting magic as James Ketch lectures on the road

IES Conference

Tentative program for the second annual regional conference, Illuminating Engineering Society, San Francisco, April 25-26, has been announced by Wm. P. Bear, general chairman. Leland H. Brown, Stanford University chairman is of the papers committee.

Friday morning session—Kenneth K. Knopf, San Francisco Section, chairman, "Television Lighting" by T. H. Shepherd. "Infra-red for Drying and Insect Control", a paper. "Applications of Ultra-violet Illumination", John T. Shannon. Symposium on Lighting for War and Defense." Four speakers, including Wm. A. Cyr and Geo. M. Rankin. "Glimpses of the Lighting of Tomorrow", Samuel G. Hibben, director of applied lighting, Westinghouse Lamp Co., Bloomfield, N. J.

—Luncheon meeting—Greetings from President A. D. Cameron, Holophane Co. Stunt, "Snow White and the Seven Watts" by Wm. A. Cyr. "The I.E.S.", an address by Frank A. Hansen, Pacific Region vice president.

Friday afternoon session—Foster K. Sampson, So. Cal. Section, chairman. "Illumination for Education" by Chas. B. Gibson. "Trends in Architectural Illumination", by Timothy Pflueger. "Fluorescent Illumination Today" by Ward Harrison (to be presented by Alston Rodgers). "Control of Brightness and Glare in Fluorescent Design", L. C. Doane. "Light Transmission Data on Translucent Media" by H. P. Doner. "Architectural Merchandising Illumination", Gene Burke. "Lifesaving on Highways" by Karl Koch.

The president's dinner with an address by President Cameron will be held at the Palace Hotel Friday evening.

Saturday morning's session—C. T. Bakeman, Washington State Chapter, chairman. "Illumination of Jewelry and Tableware", C. Schammel. "Lighting a Large Office Building (a) using incandescent lamps", R. H. Long, Standard Oil Co., "(b) Using fluorescent lamps" by Lorenz Bruun, property superintendent, Capital Co. "Selling With Light", a paper. "The Year's Best Lighting Installations", an 8-man team headed by Walter E. Potter of Portland. "Objective Standards in Fluorescent Lighting" by C. T. Bakeman. "The Year's Progress in Light Sources and Lighting Equipment (demonstrations)", Sam Hazleton. "Opportunities in Lighting" by H. N. Carroll.

Any changes from this program will be announced. The conference will be held at the Pacific Gas and Electric Co. auditorium, 245 Market St., San Francisco.

● SUPERINTENDENT OF SCHOOLS Charles B. Gibson of the Mountain View school district, an energetic fact-finding searcher for real information regarding natural and artificial illumination of school rooms, was speaker for the Southern California Section, IES, Feb. 4.

Fluorescent School

First fluorescent lighting institute in Washington was started Jan. 27, running to to Feb. 3, 10 and 17, under the sponsorship of the newly created Washington State Chapter, Illuminating Engineering Society. Meetings are held at the University of Washington Physics Hall. Course consists of four 2-hour meetings from 7:45 to 9:45 p.m. First meeting presented "The Science of Seeing the Fluorescent Lighting" by Walter Potter, engineer, G-E Lamp Division, and "Economics of High-level fluorescent Lighting" by C. T. Bakeman, chairman of the chapter, Puget Sound Power & Light Co. Other subjects in the course are "Quality of Lighting Standards," "Cost Comparisons of Fluorescent Lighting."

Charter meeting of the Washington chapter was held Jan. 6 and attended and addressed by Frank A. Hansen, regional vice president and director of Western Institute of Light and Vision. He presented the newly formed chapter a gavel on behalf of the Southern California Section. Guest speakers were G. R. Schuck, section chairman of AIEE; C. M. Howard, chairman ASCE; Rubin E. Johnston, chairman ASME; Horace M. Gaston, president Producers' Council of Washington; Norman Bost, president and Roger Walker, secretary of the Electric Club of Washington and others.

● PETITION OF THE OREGON CHAPTER of IES has been unanimously approved for the newly formed organization which began Jan. 7 when Frank Hansen, regional vice president, called a meeting at Congress Hotel, Portland. John C. Plankinton, manager Commercial Sales Bureau, Northwestern Electric Co., was appointed chairman.

LIGHT for a TURF CLUB

Fluorescent

Who

Golden Gate Turf Club, Albany, Calif. Westinghouse Electric & Manufacturing Co. equipment and engineering. Spott Electrical Co., Oakland, contractor.

The Need

Soft, flattering, well diffused illumination with a modern styling for the swank atmosphere of a turf club, its bar and promenade, cashiers' corridor, and clubhouse dining rooms and lounge.

Conditions

Beamed and often sloping ceilings varying in height from floor. Finished in light tones of high reflection value. Matt finish. Color varies in the several rooms according to color scheme. Lighting units made integral with the ceiling beams for architectural unity.

Installed

Clubhouse lounge with circular bar—picture at top of page) Thirteen type 2-CL-40 Westinghouse fluorescent fixtures, each containing two 40-watt, 48-in. lamps, mounted on beams radiating from the center pillar. Eight CL-40, single-lamp units top the mirrored octagonal pillar centering the bar.

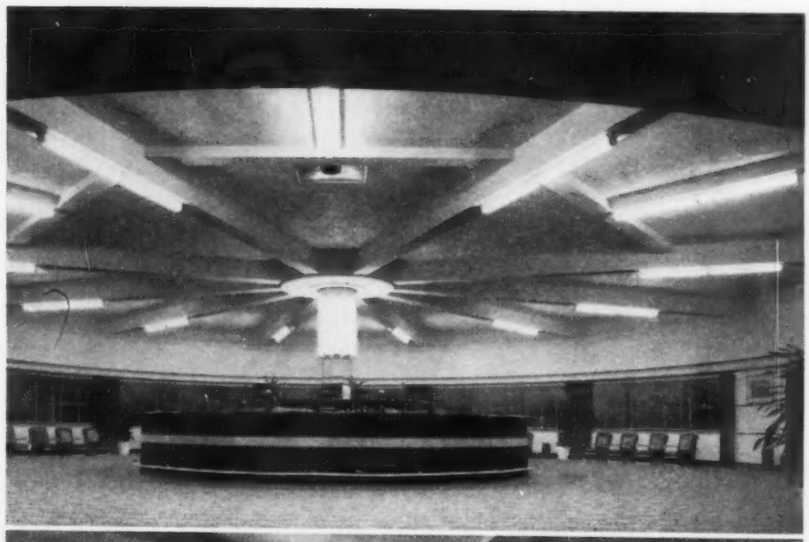
Paddock club section, cashiers' windows—(center picture) A series of the two-lamp fixtures mounted on parallel ceiling beams the length of the room.

Dining room—(lower picture) Two single-lamp fixtures mounted close to the peak of the beam span on each beam.

Total of 97 two-lamp fixtures, and 40 single-lamp fixtures installed in the building. Fixture is equipped with cylindrical diffusing glass to reduce surface brightness. Grandstands, kitchen, balcony, ground floor areas and stairways lighted by 240 Westinghouse Locklite white enameled shallow dome reflectors lamped at 500-watts, incandescent. Offices have 33 Magnalux luminaires, 500-watt. Parking areas floodlighted by 20 Westinghouse AV-20, 1500 watt incandescent units. Total connected lighting load approximately 270 kw.

Results

Clubhouse lounge, average of approximately 5 ft. candles on a plane 3-ft. from the floor. Paddock club, average 8 ft. candles. Dining room, average 7 ft. candles. Other areas have as high as 10 ft. candle average.



WHY 50 FOOTCANDLES?

TEN years ago you could probably count the 50 footcandle installations in this country on the fingers of one hand. Throughout the length and breadth of the land they were few and far between. People felt it was wasting light to spread it around that way. Fifty footcandles? The idea!

Today there are many communities where the lighting industry has had the courage to sell, and customers have had the wisdom to buy lighting systems that provide as much as 50 footcandles. Such installations are still far from becoming common, but they begin to shine out in every lighting field—in stores, factories, offices.

Three important steps have made this possible:

1 *The research which led to the Science of Seeing, proving the need for more light.*

2 *Development of new light sources which make the higher levels of lighting practical, and*

3 *Reduction in the cost of current—and lamps.*

Fortunately for the lighting industry and for the eyes of the nation, all of these developments came along together, a firm foundation for demonstrating the need for better lighting, and the practical tools that make it possible.

Sometimes, however, we are inclined to forget the basic facts of the Science of Seeing on which this new era of Better Light for Better Sight is built. Even the lighting salesmen who today are selling the 50 footcandle jobs are not always conscious of the reasons for recommending such lighting levels.

They will be better salesmen and render their customers a better service if they review occasionally the fundamentals of the Science of Seeing. Toward this end, General Electric plans to publish during 1941 a series of advertisements (of which this is the first) featuring some of the highlights of that Science. Toward this end we suggest an answer to the question. "Why 50 Footcandles?"

How Many of Your Customers Know These Facts:

Three factors are necessary for the act of seeing: the eye, the object to be seen, and a source of light.

Our eyes developed during thousands of years of outdoor seeing—under daylight levels of lighting and long distance vision. Only within the last few generations have we moved indoors and subjected our eyes to artificial light and difficult visual tasks.

Our ancestors did most of their seeing under 5,000 to 10,000 footcandles in the sunlight and 200 to 1,000 on overcast days or in the shade of a tree.

Today, most people attempt much more critical seeing under light only 1 or 2% of that. The result may be eyestrain, fatigue, nervousness and eventually the impairment of vision.

The human body is a seeing machine.* We see with more than our eyes alone. Our whole nervous-muscular system is affected. In fact, the strain of prolonged seeing under difficult conditions may be more tiring than the hard physical work of digging a ditch.

Are You Dramatizing the Science of Seeing with Such Simple Facts—

THAT it takes 3 times as much light to read a newspaper with the same ease as it does a well printed book?†

THAT good light aids poor eyes even more than normal eyes?

THAT it is estimated we are using our eyes for severe visual tasks about 30% more than was common a generation ago—and many times more than a century ago?

THAT a fourth of our children have defective vision?

THAT three-fourths of all people over 50 suffer from defective vision?

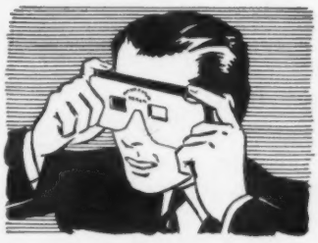
Many complex laboratory researches have demonstrated that we see faster, more easily, and with less fatigue, the closer we come to outdoor seeing conditions.

*See Chapter VI, "The Science of Seeing" by M. Luckiesh and Frank Moss
†See Chapter V, "The Science of Seeing"

G-E MAZDA LAMPS

Typical of many of today's better fluorescent lighting installations is the better than 75-footcandle illumination in Pugh Brothers' jewelry store in Youngstown, Ohio. Tests show that better light speeds sales, makes merchandise more attractive, and improves employee morale.

In other words, *better light* literally means *better sight.*



Furthermore, the average person, when given the opportunity to select the amount of light under which he can most easily perform a fairly difficult seeing task like reading a newspaper, selects somewhere between 100 and 200-footcandles.

So to the question "Is 50-footcandles of light enough for critical seeing?" science can only answer "No. Generally you need all you can get." But 50-footcandles is a long step in the right direction—and it is easy to get with modern light sources and equipment.

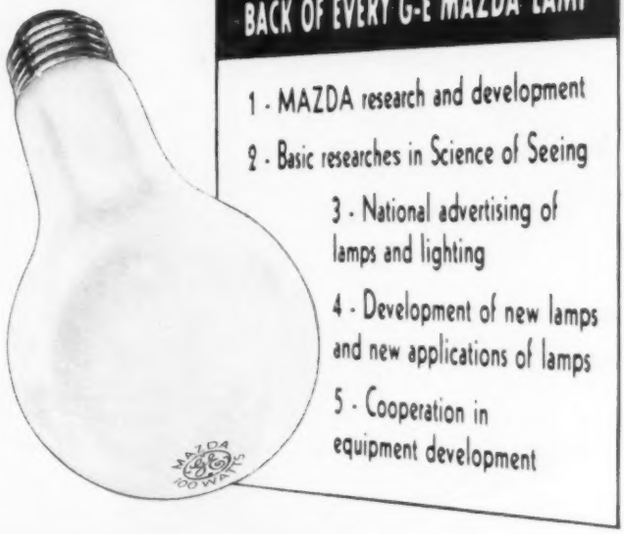
Of course, every lighting job should be considered individually and planned to produce the best results. The lighting engineer equipped with his light meter to measure light accurately, and his visibility meter to determine the visibility of the task, can easily solve any lighting problem and recommend the proper treatment.

Forty-Niners Club Announced

SOME twenty years ago, General Electric welcomed many lighting salesmen to membership in a 10 Footcandle Club. That was considered good lighting back in 1920. But science has revealed new goals. The tempo of modern business demands more of lighting.

In 1941 this Club is brought up to date as the Forty-Niners Club, and the honor of membership is extended to any salesman who has been primarily responsible for selling an installation of 49-footcandles or more, or to any executive who works under 49-footcandles. The attractive emblem shown at the right will be sent to all members. A brief description of the installation, attested by the sales manager, is all that is necessary for membership. Send it to Secretary, Forty-Niners Club, General Electric Company, Nela Park, Cleveland, Ohio, or consult your G-E Lamp Division for further details.

REMEMBER:


BACK OF EVERY G-E MAZDA LAMP
1 - MAZDA research and development
2 - Basic researches in Science of Seeing
3 - National advertising of lamps and lighting
4 - Development of new lamps and new applications of lamps
5 - Cooperation in equipment development

GENERAL ELECTRIC

EMEA *Dope Sheet* — *Edited by Howard C. Park*
EMEA of So. Calif.

Wire Data

Calculation short-cuts and usefu basic information

The size, diameter, area, resistance, or weight of any wire size between 4/0 and 40, may be approximately determined by the use of a few given rules and factors, if the value desired to be determined is known for any other size of wire.

The values of No. 10 wire are generally used for this purpose as they are easier to remember than any other one size.

Actual Values of No. 10 Wire

10,404 cir. mil area
102. mil. dia.
.102 inch dia.
1.02 ohms per 1000 ft.
31.4 lb. per 1000 ft.

Approximate Values of No. 10 Wire

10,400 cir. mil area
100 mil dia.
.1 in. dia.
1. ohms per 1000 ft.
31 lb. per 1000 ft.

Diameter of Wire

Since each successive wire size is 1.1229 times larger/smaller than the preceding size any desired size may be determined by a process of progression. Each *sixth* size larger/smaller will approximately double/halve the diameter (*or* $X = 102. \times 1.123^N$.
X=cir. mil of wire N. sizes larger/smaller than No. 10 wire.)

Area, Resistance and Weight

(these factors are all proportional)—The next size *larger* will be 1.2[illegible] (1.261) *greater*. The next size *smaller* will be 1.26 less. Each *tenth* size larger/smaller will be approximately *ten* times greater/less.

No. 2 of a series of boiled-down work sheets, worth keeping handy

Density of Copper

The density of copper is 8.89 grams per cc. or .32117 lb. per cu. in.

Standard Copper Resistance

The International Standard of Resistance for annealed copper is defined as a wire one meter in length and weighing one gram whose resistance is .15328 ohms at a temperature of 20° C. (68° F.) The common practice in the wire and cable industry is to refer to the resistance of copper at 25° C. (77° F.) which is .15635.

Standard International Units of Resistance of Annealed Copper

	20 C. (68 F.)	25 C. (77 F.)
Ohms per mil. foot	10.371 or (10.4)	10.578
Ohms per 1000 ft. lb.	165.99	169.07
Ohms per mile lb.	875.2	892.7

Microhm-inch	.67879	.69237
Ohms per meter, gram	.15328	.15635
Ohms per meter, Sq.mm.	.017241	.017584
Microhm-cm.	1.7231	1.7584

Resistivity and Conductivity of Copper Wire

Type of Wire	Wire Sizes	Resistivity (ohms mi., lb.) 20 C.	25 C.	Conductivity %
Annealed (soft drawn)—	All sizes	891.58	909.41	98.3
Medium hard drawn—	4/0-1/0	896.15	914.07	97.8
	1-18	905.44	923.55	96.8
Hard drawn—	4/0-1/0	900.77	918.79	97.2
	1-18	910.15	928.35	96.3
Tinned or coated—	4/0-1	896.26	914.17	97.65
	2-10	900.87	918.89	97.15
	12-24	910.24	928.45	96.15
	25-28	929.58	948.17	94.15
	29-40	939.56	958.34	93.15

USEFUL FORMULAS

		20° C.	25° C
Ohms per 1,000 ft.	=	$\frac{.0081455}{\text{area in sq. in.}}$	.0083084
	or	$\frac{10371.176}{\text{area in cir. mil.}}$	10579.195
Feet per ohm	=	area in sq. in. × 122770	120362.7
	or	area in cir. mil. × .09642	.09453
Ohms per pound	=	$\frac{2.1135}{(\text{area in sq. in.})^2 \times 10^6}$	2.15577
	or	$\frac{3426279}{(\text{Area in cir. mil.})^2}$	3494805.
Pounds per ohm	=	$(\text{area in sq. in.})^2 \times 473160.$	463882.
	or	$\frac{(\text{area in cir. mil.})^2 \times .29186}{10^6}$	.286078
Pounds per 1,000 ft.	=	area in sq. in × 3854.09	
	or	area in cir. mil. × .0030269	
Feet per pound	=	$\frac{.259465}{\text{area in sq. in.}}$	
	or	$\frac{330361}{\text{area in cir. mil.}}$	

TEMPERATURE COEFFICIENT—
(100% CONDUCTIVITY)—
20 C. .00393 per deg. Centigrade.
25 C. .00385 per deg. Centigrade.
68 F. .00218 per deg. Fahrenheit.
77 F. .00214 per deg. Fahrenheit.

Temperature coefficient at any temperature or conductivity may be calculated from the following formula, since temperature coefficient is proportional to conductivity.

$$\text{Temp. coeff.} = \frac{0.0407}{\text{ohms (mil. foot) at } t_o \text{ C.}} \text{ per deg. C.}$$

$$\text{or} = \frac{0.0226}{\text{ohms (mil. foot) at } t_o \text{ F.}} \text{ per deg. F.}$$

TO REDUCE RESISTANCE TO 25 C. (77 F.)—

Copper Temperature—Degrees Centigrade	Fahrenheit	Multiplying Factor
0	32	1.107
5	41	1.084
10	50	1.061
15	59	1.040
20	68	1.020
25	77	1.000
30	86	.981
35	95	.963
40	104	.945
45	113	.929
50	122	.912

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PRINT IN BINDING

NEW PLANT CAPACITY overnight?

WESTINGHOUSE INDOOR **AIR-COOLED** TRANSFORMERS HELP YOU GET GOING **FAST!**

NEVER BEFORE ALL THESE ADVANTAGES:

- No liquids
- No vault required
- No fire hazard
- No toxic gases
- No explosion hazard
- Low installation cost
- Low maintenance
- Shorter secondary cable runs
- Light weight
- Easy handling
- Less space required
- Pleasing appearance

SPEEDY EXPANSION is an urgent problem in many industries right now. Westinghouse Air-cooled Transformers are ready. With four years of field testing in the records you can put them on your lines with complete assurance of reliable performance, plus a totally new standard of transformer safety.

INSTALLATION IS EASY. No vault is needed. Place it anywhere indoors at the load—with full safety to personnel—and save again with shorter cable runs.

BONE-DRY! ABSOLUTELY SAFE! Not the remotest possibility of an explosion! Nothing to catch on fire or give off toxic gases! It improves plant safety ratings! It reduces maintenance costs! No liquid reconditioning worries! No gaskets! No valves! No gauges and piping to inspect!

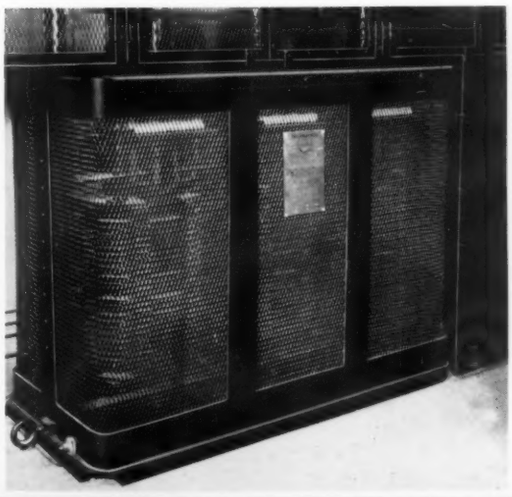
THE ONLY large capacity, completely developed, thoroughly field-tested, air-cooled transformer on the market today!

Type ASL Ratings, for 60 cycle service, 13,200 volt class and below, are: 150 to 1250 kv-a single phase, 150 to 2000 kv-a three phase. Small air-cooled transformers for indoor service from 1 to 100 kv-a, 2400 volts and below.

Ask your Westinghouse representative for complete information, or write for Booklet 2254, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N.

IT'S SAFE ANYWHERE!

Here is a picture of a Type ASL Air-cooled Transformer installed in the basement of an office building. It is rated 150 kv-a, 3 phase, 60 cycle, 2400 to 240 volts.



J-70321

Westinghouse Transformers

Westinghouse Briefs

. . . showing the extent of Westinghouse engineering activities directed toward the improvement of transmission and distribution equipment used on alternating-current systems. These activities, which result in better service to you and a wider use of electricity by your customers, have been encouraged by your purchase of Westinghouse apparatus.

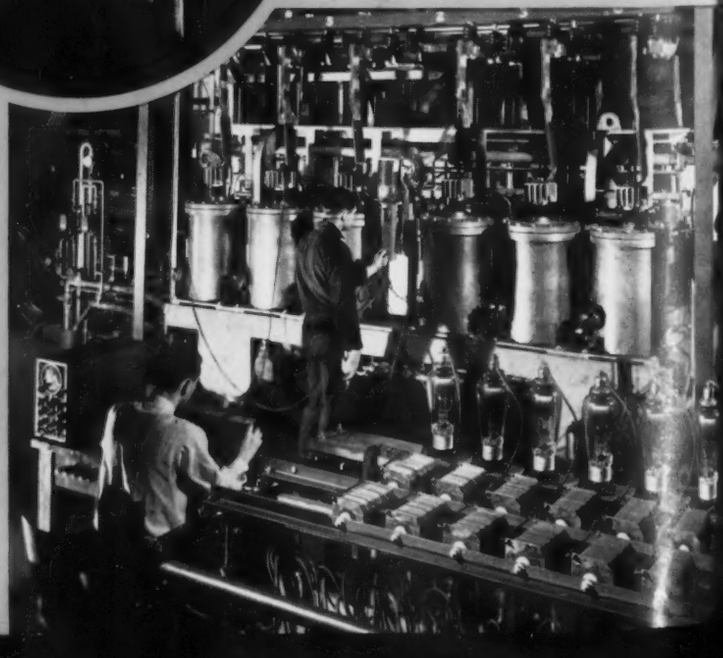
WESTINGHOUSE ELECTRIC & MFG. COMPANY

TRANSFORMER ON TEST...at the transformer factory. A "lightning laboratory" provides means of testing power transformers for protection against lightning. Such tests as these, with the resulting engineering advancements, assure users of uninterrupted service.

ONE OF THE IMPULSE LABORATORIES...where development work is being continuously carried on to improve electrical apparatus such as lightning arresters, small circuit breakers, etc. Here various types of impulse surges are created at will.

SUPPRESSING THE ENEMIES OF RADIO... To a radio interference laboratory at East Pittsburgh, Westinghouse engineers bring insulators, switches, thermostats and kindred devices. All are exhaustively tested for radio interference and methods of minimizing interference are scientifically developed.

IRONING OUT THE WRINKLES... In a laboratory exclusively devoted to the solution of conversion problems, a large Ignitron rectifier is shown being "put through its paces" just before shipment.



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Wages and Legislation

Northern California Contractors Assn. ponders them at Oakland annual meeting

WAGE scales and labor problems dominated the entire program of the annual meeting of Electrical Contractors' Assn. of Northern California, Oakland, Jan. 25. From the moment it was opened by Pres. Grover A. Grieder, of Stockton, to the adjournment by the newly-elected president, Dan Bronson, California Electric Co., Oakland, the representative group of contractors from all sections of northern California tried to understand the new pressures put upon their declining business by government and labor.

Sydney P. Murman, assistant regional attorney for the Wages and Hours Division, U.S.A., interpreted the wage and hour law as it might affect electrical contractors. From his explanation, it would appear that practically all electrical contractors would come under the broad rulings as to what constitutes inter-state commerce, as supported by recent Supreme Court decisions. Only a contractor doing work for owners of residential property exclusively could hope to escape the implied coverage of the act. Exemptions there are, but few of these would apply to even a small operator.

Exemptions would only apply to wages and hours of some employees but would not exempt an employer from keeping the records prescribed in the act. Making of an installation for a store, commercial building, or even a speculative builder would be classified as "wholesaling" and in the "flow of commerce."

Allen Miller, registrar of contractors for the state of California, next talked on proposed changes to the California contractors' license law as discussed before the California contractors' legislative council, made up of representatives from all of the various branches of contracting. Technical loopholes by which evasions have been made are aimed at by the revisions sought from this session of legislature.

Prequalification examinations have been started for general contractors, Miller announced, and have resulted in about a 70% mortality in applicants. The examination, covering simple business practices chiefly, is not difficult. A resolution was passed later in the meeting asking the Board to set up rules and examination procedure for electrical contracting applicants in a similar manner.

There are 2,060 electrical contractors' licenses in the state out of a total of 39,500 licenses of all classes.

On other legislative changes which may influence the contracting business, J. D. O'Connor, chairman of the committee, Sacramento, and Wm. J. Varley, representative of the San Francisco association, spoke. One of these, a move to have exempted from the Unfair Practices Act sales made to cities and political subdivisions, would void much of its value as a statute by which to handle selling below cost. A number of other legislative proposals have been introduced. Summaries of these are to be sent to contractors through the association for their study and discussion with local representatives.

J. R. Lazarus, northern California manager for Pacific Coast Electrical Assn., opened the afternoon session with a talk on the value of uniform ordinances and the more widespread adoption of the 1941 National Electrical Code. He offered the services of his association and his own legal experience to any community contemplating revision of its code or to any county considering a county ordinance.

Dan Bronson, of Oakland, at right, was elected president. With him is Ted Curry of Fresno, delegate to NECA

One of the three remaining suggested resale pricing services, the Pacific Coast Electrical Price Book, was discussed by A. E. Rowe, its publisher. He explained present-day increased difficulties which make the ublishing of a standard pricing list difficult. When started 25 years ago, there were but a few wholesalers and manufacturers' agents and price fluctuations between them were not so great. Now there are some 40 to 50 wholesalers and as many manufacturers' agents, with selling policies at great variance, likewise competition from mail order chains and five-and-ten-cent stores. All of these make the averaging of prices for suggested resale somewhat difficult. Rowe also warned contractors to watch the market carefully on prices of materials involving steel, copper and such other products as are needed in the national defense program.

W. J. Welsh, secretary of the Sacramento Contractors' Association, told of the desires of contractors for some leeway, at the jurisdiction of a local inspector for service drops to low bungalows where the roof line is less than the required 12 ft. from the ground.

Ted Curry, Curry Electric, Fresno, and Clyde L. Chamblin, California Electric Construction Co., San Francisco, reported on the National Electrical Contractors' Assn. convention at Jacksonville, Fla. Chamblin, vice chairman of the labor relations committee, spoke especially of the labor aspects of a contractor's business in view of modern times. He told of the elaborate and complete labor research organization maintained by the unions and the need of the employer to study costs and facts, to have more complete organization in order to deal with labor on an equal basis. This, he said, was intended in the friendliest of spirits but with a realization that the contractors needed the high grade organization and factual backing which the union now provides its trained staff of business agents and negotiators. In local agreements with the union, he urged that clauses be inserted referring disputes which cannot be settled locally to the National Council for Industrial Relations, as a final "supreme court" for the industry.

President Greider then called for a report from representatives from all sections of the state as to present wage scales and pending negotiations for increases. It developed that there is a movement to standardize the electrician's wage scale in northern California at $12 regardless of the territory. Evidently the scale started from the wages now being paid electricians on big defense projects under rush construction and eager to get good mechanics.

A motion was carried to appoint a committee to meet with labor representatives and discuss the various aspects of such a uniform wage scale from a realistic local standpoint.

Importance of the apprenticeship training program was told by Varley as he announced that the government had estimated the manpower needs for electricians and other skilled crafts in northern California at some 62,000 men. Active participation in apprenticeship

training programs was urged by Varley as a means for contractors to have a voice in the training program and in the placing of apprentices.

"What Do You Offer Your Customers?", an analytical article reprinted from the proceedings of the NECA convention, was discussed by Lloyd Flatland. A product of the research department of the Chicago Contractors' Association, it makes a comparative analysis of the services offered by a contractor to an industrial or commercial establishment and gives a basis for estimating what it costs the owner to do the same work with crews of his own.

A resolution was passed urging the legislature to staff the Industrial Accident Commission with enough inspectors to inspect industrial occupancies, at least outside incorporated areas. With its limited personnel, the commission has not been able to enforce its safety orders and in view of expansion for defense in a number of unincorporated areas, safety regulations were declared especially necessary.

At the election of officers concluding the meeting, Dan Bronson of Oakland was elected president, Tom Robinson of Fresno, vice president W. A. Cyr, San Francisco, secretary-treasurer, and the following on the board of directors: Geo. Abbett, San Francisco; E. L. French, Sacramento; Grover Greider, Stockton; H. R. Ecklund, San Rafael; B. J. Solomon, Pacific Grove; Seth Cohn, San Mateo; Ed Pierce, Vallejo; Allen G. Wilson, Santa Cruz; Roy Butcher, San Jose.

Los Angeles NECA

A. L. Stone, of Stone Electric Supply Co., was reelected president by the Los Angeles Chapter, NECA, at its annual election, January 6; L. L. Goddard, Pacific Electrical & Mechanical Co., vice-president; and W. B. Walker, H. H. Walker, Inc., treasurer. The new executive committee includes, besides the officers named, G. E. Arbogast, Newbery Electric Corp.; J. O. Case, Quality Electric Co.; George DeAth, Peerless Electric Construction Co.; Herbert L. Evans, Nicholas Electric Co.; R. Max Fry, R. M. Fry Electric Co.; and Sidney F. Hill, Hill Electric Co. The present executive secretary, J. J. Newitt, was reappointed.

In addition to the usual functions of the Chapter, an aggressive campaign is under way to keep industrial and commercial establishments advised of the availability of the services of qualified electrical contractors.

Serious consideration was given to discussion of apprentice training, sales promotion, industry and labor relations, legislation, and of their responsibility in maintaining and extending the facilities for defense production. "These new demands," said Vice-President Goddard, "will require the exercise of a high type of good business judgment, coupled with skillful and ingenious operation."

Wholesalers Annual

N. J. McDonald, general sales manager of Thomas & Betts and several other national figures, are promised for the Friday morning meeting of Pacific Division, National Electrical Wholesalers Assn. at Del Monte, Feb. 13-15, according to R. A. Balzari, secretary.

The usual annual review of business possibilities as enunciated by prominent utility executives will be conducted under R. E. Fisher, vice president in charge of public relations and sales, Pacific Gas and Electric Co., as chairman of the utility program. George Gadsby, president, Utah Power & Light Co., James Polhemus, president, Portland General Electric Co., will be the two principal speakers. O. R. Doerr, general sales manager, P G and E, and George Tenney, editor of ELECTRICAL WEST, will present an analysis of business figures for Western markets.

NWEL & P at Spokane

The 1941 annual meeting of the Business Development Section, Northwest Electric Light & Power Assn., is to be held at the Davenport Hotel, Spokane, Wash., Mar. 27-29, according to announcement by Daryl B. Leonard, Pacific Power & Light Co., Yakima, chairman.

This year the meeting will follow the pattern of recent years' meetings with a general session to open it Thursday morning, and to close it Saturday morning. The intervening sessions on Thursday afternoon and all day Friday will be devoted to separate conferences of the following Bureaus and committees with chairmen as indicated: Residential Sales Bureau, D. J. McGonigle, Montana Power Co., chairman, which will hold two committee conferences—one on Home Modernization under the chairmanship of Frank Tool, Washington Water Power Co., and Home Service under W. A. Huckins, Utah Power & Light Co.; Commercial & Industrial Sales Bureau, A. H. Greisser, Portland General Electric Co., chairman; Rural Sales Bureau, Ben W. Faber, Portland General Electric Co., chairman; and Advertising Bureau, J. Harvey Leach, Puget Sound Power & Light Co., chairman.

No announcement was made on the subjects or speakers for the general sessions. They will be announced later as commitments are received.

Wage Scale Up

Under a revised wage agreement with local No. 6, I.B.E.W., the San Francisco Electrical Contractors' Assn., Inc., agreed to a wage increase from $11 to $12 a day beginning Feb. 1. Negotiations have been in progress for over a month.

Crux of the decision revolved around a requirement in the former agreement that each shop employing one or more journeymen would have to have a foreman at a $1 a day above the scale. Thus more than 60 per cent of the shops were already paying $12. Under the new agreement, a foreman will not be required until five journeymen are employed.

Another provision of interest was that for each five men, one journeyman over 55 years of age should be employed. The agreement also called for a reduction in work week or hours in case of slack business in order to spread work.

Scales paid to electricians on defense projects materially affected the situation. Defense projects were drawing off the best skilled mechanics with higher wages than offered in that city.

Agenda

San Diego Electric Club—Ray A. Edwards, personnel director, San Diego Gas and Electric Co. was inaugurated as president at the annual party and dinner dance of the club, Jan. 21. Dr. Phillips Thomas, research engineer, Westinghouse Electric & Mfg. Co., was presented to the public under sponsorship of the club at Roosevelt Junior High School auditorium, Jan. 7.

Electric Club of Washington—F. L. Van Slyke, president, Washington Electrical Contractors' Assn., talked on the proposed electrical legislation to provide fees for inspection in rural areas, Jan. 27.

IAEI—Utah Chapter, at Utah Power & Light Co. auditorium, Salt Lake City. Ray L. Davis continued the discussion on "Services" and M. E. Dansie discussed "Overcurrent protection" from the 1940 National Electrical Code.

IAEI—Southern California Chapter met Jan. 22 at San Bernardino. Next meeting is scheduled for Mar. 26 at Alhambra.

IAEI—Puget Sound Chapter—At the last meeting it was announced that Tacoma had made its bid for the next Northwestern Section annual convention. Chief Inspector Newton of the state of Washington read the proposed state requirements on Code interpretations for 1941.

IAEI—Greater Central Valley Chapter held its annual meeting in mid-January at the state capitol building, Sacramento, for election of officers and discussion of fluorescent lighting and the 1940 Code.

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WITH production schedules throughout industry expanding far in excess of all normal requirements, and with almost every community experiencing a new tempo of activity—electrical power assumes a position of vast importance! Thus, only the finest quality electrical wires and cables can be trusted with this growing responsibility for power transmission and distribution. That's why electrical engineers and contractors confidently rely on American Steel and Wire Company products.

Every wire and cable manufactured by American Steel and Wire Company is a true product of outstanding quality and long-lasting service—as perfect as modern methods can produce. Each one reflects a background of more than 100 years of engineering skill and manufacturing experience. American Steel and Wire Company wires and cables are available in a wide range of constructions, types and sizes — from the smallest magnet wire to huge submarine cables. Write today for complete information and catalogs.

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UNITED STATES STEEL

PCEA Panorama — Edited by Mary Shoop

ELECTRIQUIZ

Mark these statements true or false. Turn to page 106 for the answers.

1. The over-all cost of fluorescent lighting always is cheaper than incandescent to provide the same illumination.
2. Because of the low surface brightness of the fluorescent tube, it is eminently satisfactory to use lamps without covers.
3. Fluorescent lamps will operate satisfactorily in any temperature.
4. The light from a fluorescent lamp which strikes the reflector may be reflected back through the lamp.
5. Nela Park is a suburb of San Francisco.
6. Central station energy is very cheap compared to that purchased in the form of flashlight batteries.
7. This year's president of the American Institute of Electrical Engineers resides in the West.
8. "Musical Americana" is G-E's coast-to-coast radio program.
9. Only about 20% of irons in use today are automatic.
10. One hundred candles give more light than a 100-watt incandescent lamp.

Convention Ahead!

Committees line up timely program for Coronado

"The Electrical Industry's Contributions to Progress" will be the theme of the 24th annual convention of the Pacific Coast Electrical Association to be held May 21, 22 and 23 at the Hotel Del Coronado. Around this broad subject will be centered interesting addresses, demonstrations and exhibits highlighting the many ways in which every branch of the electrical industry has assisted in man's personal, business and social advancement.

Joseph A. Long, Southern California Edison Co., Los Angeles, has been appointed general convention chairman to fill the post vacated by the death of Richard E. Smith. Mr. Long is being given able assistance by the following:

Program manager, G. H. P. Dellmann, San Diego Gas and Electric Co.

Committee chairmen — attendance, Roy N. Phelan, ELECTRICAL WEST; banquet, W. H. Robinson, Jr., G-E Incandescent Lamp Department; golf, H. S. Warren, Westinghouse; hotel, Alfred May, San Diego G & E; ladies entertainment, Lane D. Webber, S Calif. Edison; publicity, Howard W. Hayes, S Calif. Edison; reception, Stanley W. Scarfe, G-E; registration, A. D. Brown, Allis-Chalmers; transportation, George A. Campbell, S Calif. Edison; ushers, R. Graham Holabird, National Electric Products Corp.

Wiring in L A

PCEB licensed to conduct national committee's work

The Pacific Coast Electrical Bureau has been licensed by the National Adequate Wiring Committee to conduct the latter's certified adequate wiring program in Los Angeles, Burbank, Pasadena, and Glendale, Calif. Supervision of adequate wiring promotion and the certification of homes meeting the committee's national standards now is being carried on by the bureau through its Los Angeles office.

LONG

Essays

Contest papers are in the hands of judges

Keen interest is attending the judging of the PCEA essay contest held in connection with the annual convention May 21, 22 and 23 at the Hotel Del Coronado. The entries now are in the hands of the judges, who promise a decision as early as possible. The contest ended Feb. 1.

A large number of entries from all parts of PCEA membership territory were made in the competition, which limited the essays to 750 words on the subject of "Why You Should Rent, Buy or Build Only an Adequately Wired Home." The contest was open to all employees of Class "A" members of PCEA, except officers and department heads.

Judges are George C. Tenney, editor, ELECTRICAL WEST, chairman; A. C. Joy, advertising manager, PG and E, and Miss Agnes Barrell, advertising counselor, Northern California Electrical Bureau, all of San Francisco.

Prizes will consist of trips to the convention at Coronado with all expenses paid.

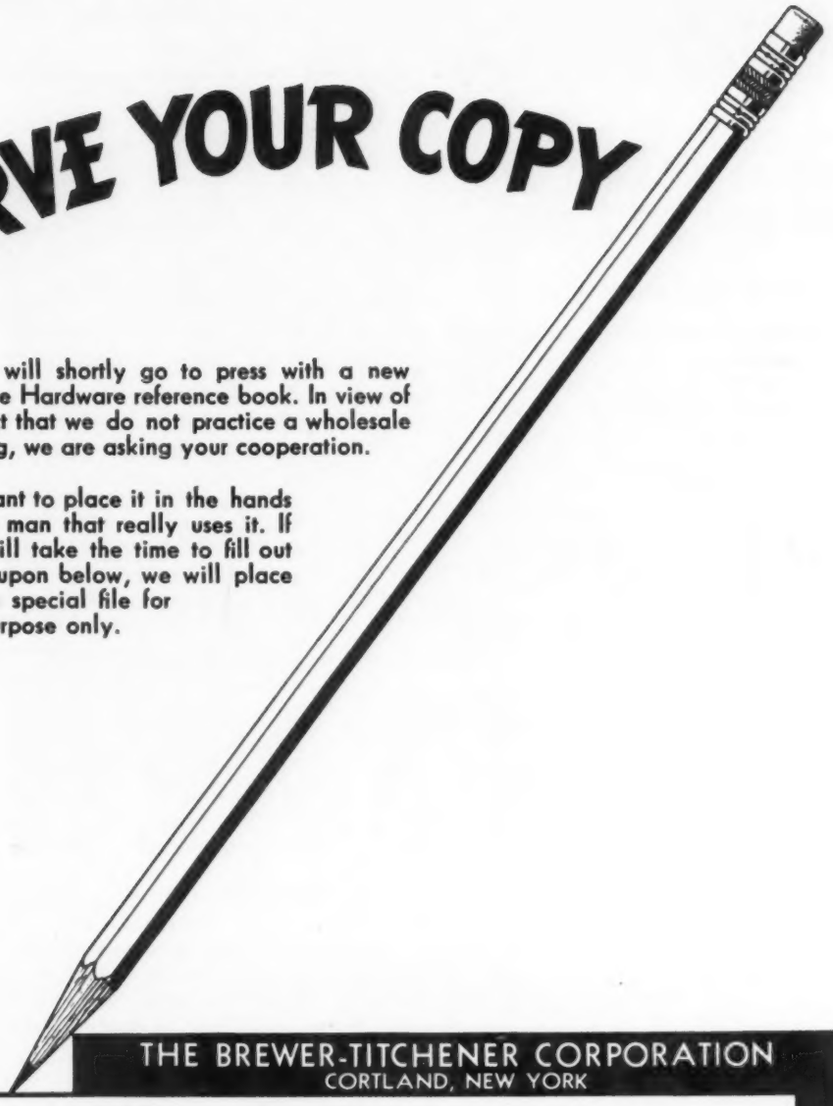
WHO AM I?

I was born on Aug. 8, 1891, on a farm about 30 mi. from Chicago. At the age of six I came to California with my parents, living on a farm near Corning. My father passed away during our first year in California, and our family moved to Santa Cruz where I completed my grammer and high school education and attended business college. My first job was with the Coast Counties Gas and Electric Co., where I went to work on May 1, 1907, as a roustabout storeroom clerk. Who am I?

In 1930 I went to Portland as vice-president and general manager of an affiliated company operating in Oregon and Washington. In the spring of 1933 I returned to California, resuming my duties as general superintendent, a position I still hold. Who am I?

I was married in 1911 and have three sons and a three-year-old grandchild. I am a director of PCEA, a past president of the Santa Cruz Chamber of Commerce, a Past Exalted Ruler of the Santa Cruz chapter of the BPOE, and a member and past president of the Santa Cruz Rotary Club. My name is: See page 106.

PLEASE RESERVE YOUR COPY



B.T.C. will shortly go to press with a new Hi-Line Hardware reference book. In view of the fact that we do not practice a wholesale mailing, we are asking your cooperation.

We want to place it in the hands of the man that really uses it. If you will take the time to fill out the coupon below, we will place it in a special file for this purpose only.

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NEWS *of the industry*

EVENTS AS THE SHORT MONTH GETS UNDER WAY

Boost for air conditioning

A full-fledged exposition and two national conventions will give air conditioning a West-Coast send-off June 16-20. All will take place simultaneously in San Francisco. First of this month found 70% of the space in San Francisco's big Exposition Auditorium reserved for the show, and both air-conditioning groups were hard at work on plans for the first Western conventions in their respective histories.

The American Society of Heating and Ventilating Engineers has chosen G. M. Simonson, consulting engineer, San Francisco, as convention chairman, and will meet in the Palace Hotel. The Heating, Piping and Air-Conditioning Contractors National Assn. will meet in St. Francis Hotel, with Daniel Hayes, Security Plumbing Co., San Francisco, as convention chairman.

Managing the exposition, which is sponsored by the ASH&VE, is the International Exposition Co., which maintains permanent headquarters at Grand Central Palace, New York.

Air-conditioned cows

In a publicity release with a Singapore dateline, Carrier Corp. reports that 120 cows have, since Jan. 10, been living in an air-conditioned barn on the Malayan Peninsula. Barn temperature is maintained at 75°, as against 100° and almost unbearable humidity outside. The installation is the result of a smaller one several years ago, which is reported to have established the fact that while air-conditioning does not increase milk production it does prevent production from being prematurely reduced by hot weather.

The big money

President Roosevelt's 17½ billion-dollar budget contains requests totaling $150,000,000 to carry on construction of New Deal power projects and distribution systems during the fiscal year beginning July 1, 1941. Of this sum, nearly $28,500,000 is specifically earmarked for distribution and transmission facilities; the rest for continuing construction of hydro-electric and TVA's emergency-defense steam-generating plants.

No new projects are given funds to get them started in next year's budget recommendations. But this does not mean that no new projects will be started. Any of the pending power developments for which the Congressional "power bloc" can wangle a national defense aura will get a prompt green light and whatever funds that can be spent on them before mid-summer of 1942.

A major item in the budget: $12,957,900 for Bonneville, of which the Bonneville Administration budget will earmark about $7,000,000 for completing its 230 kv. grid.

Here comes hydro

National defense power resources for northern and central California received a boost with the announcement of immediate construction of PG and E's Cresta and Pulga plants on the Feather River. Contracts have been let to G-E for two 37,500-kw. generators for Cresta and to Westinghouse for two 45,000-kw. machines for Pulga. The two plants will cost $22,000,000 and the associated transmission facilities $7,000,000.

Coupled with construction now under way, these new plants will give PG and E a 23% increase in installed capacity over a three-year period. For details on PG and E construction see page 47.

Engineers on the air

A series of Monday night broadcasts over NBC Blue was launched by the American Institute of Electrical Engineers Jan. 27. Subject of the series is electrical engineering and the defense of the nation. In the first program, AIEE President R. W. Sorensen explained the part of the electrical engineer in the nation's power, communications and transportation systems. Subject for Feb. 3 was "The Electrical Engineer in the Army." Subjects to come are: Feb. 10, "The Electrical Engineer in the Navy"; Feb. 17, "The Electrical Engineer in Defense Production"; Feb. 24, "Mobilizing Electric Power for Defense,"; Mar. 3, "Electrical Research for Defense." Each program is 15 minutes, starting at 7:45 p.m. E.S.T.

San Diego on its own

San Diego Gas & Electric will become an independent operating company as a result of a plan bearing FPC approval and effective Jan. 15 whereby Standard Gas & Electric Co. will exchange its holdings of San Diego common for notes and debentures of Standard G & E. As soon as a sizeable volume of its common stock is in the hands of the public, San Diego G & E will apply for listing of the stock on a national exchange. Basis of the offer is 58 shares of San Diego common stock for each $1000 face value of Standard notes and debentures.

Will PUD's be taxed?

Washington PUD commissioners are showing anxiety over how local and state taxes lost in the take-over of private utility properties may be supplanted. Possible methods of taxing PUD's were considered at a PUD Commissioners Assn. meeting last month in Seattle. State law prohibits any form of taxation against a public body such as a PUD except an excise levy against gross earnings. Also the state cannot tax a local district for local purposes. Sole recourse for counties, cities and school districts in recouping lost tax revenues would be to levy individual excise taxes against PUD revenues.

Our low-cost utilities

Combined cost of various utilities for the home were compared in a recent report of the California Railroad Commission. Evidence gives the low cost of living on the West Coast. On the basis of an average use of 30.6 therms of gas, 75 kw.-hr. of electricity and a 2-party telephone line, the Commission reported the following total monthly charges for some key cities: San Francisco, $7.29; Los Angeles, $7.93; Denver, $9.79; Philadelphia, $12.43; New York, $13.93; Boston, $14.19.

The facts of the matter

In the Far West its 146 million for electrical facilities in '41, and more sales. See pp. 41, 44, 60.

Electric industry for Calif.

Manufacture of metallic magnesium for use in airplane construction may be undertaken at a plant to be built by Henry J. Kaiser adjacent to the cement plant constructed by him at Permanente, Calif., last year. By utilizing the Hansgirg electric furnace reduction process, the plant would be one of the major industrial electrical customers in northern Calif. Output: 12,000 tons per yr.

COLUMBIA POWER BILL IS BEFORE CONGRESS

Already before the new Congress is the bill endorsed by Secretary Ickes to set up a Columbia Power Administration in the Dept. of Interior to socialize electric energy distribution in the Pacific Northwest. New Dealers look to the measure as the vehicle for taking over the Puget Sound P & L and other private utilities for consolidation with Grand Coulee and Bonneville to create a vast federal power pool in Washington and Oregon. The bill is considered likely to pass.

The measure proposes a single administrator appointed by, and subject to Ickes. The CPA's authority would be limited to authority over sale, transmission and, for temporary periods, distribution of power; operation of the dams continuing as now: Bonneville under Army Engineers, Grand Coulee under the Bureau of Reclamation.

The bill would give the CP Administrator authority to acquire by purchase, lease, condemnation or donation whatever property of existing private utilities he finds "necessary or appropriate" to carry out the purposes of the law. He must, however, sell to local public agencies or cooperatives such distribution facilities as are acquired as promptly as possible. For financing purchases of private properties, the Administration is authorized to float Government-guaranteed non-mortgage bonds up to a total of $200,000,000 outstanding at any one time.

Existing Bonneville law requiring that public agencies be reserved 50% of all power available for sale is continued in the proposed measure, and the rates and practices now in effect on the Bonneville and Grand Coulee projects are carried over to the Administration. Practically all policies of the Administrator are subject to the approval of the Secretary of Interior.

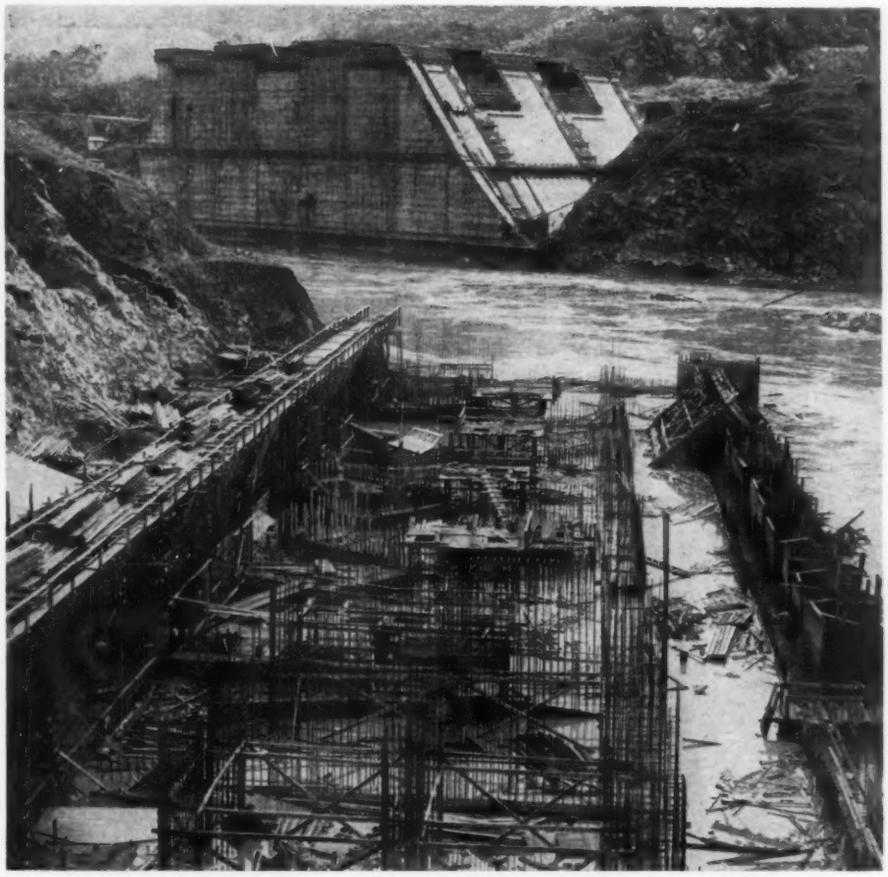
Provision for reimbursing municipalities for lost tax revenues through purchase of private utility property authorizes the Administrator to make payments not to exceed the average tax receipts in the three years prior to acquisition. Amount of the payments is fixed by the Administrator with provision made for appeal by the municipalities to the Secretary.

Meanwhile, other discussions are afoot

Negotiations aimed at the purchase of the Puget Sound Power & Light Co. system are proceeding between representatives of the Bonneville-Coulee Power Administration and company officials. Early in January Dr. Paul J. Raver and several other Northwest public power people conferred in New York with officers of Engineers Public Service Co. (holding company for Puget Sound P & L), then issued the following joint statement:

"Further studies will be prosecuted diligently, and if an offer is made the security holders and the public will be advised promptly. All those present (at the meeting) deplored the speculative activities in the company's securities, which either the buyer or the seller, one or the other, is sure to regret."

Further conferences were held later in the month with company officials in Seattle. Final purchase is contingent upon availability of funds, either through the proposed Columbia Power Authority bill now before Congress or from the RFC.



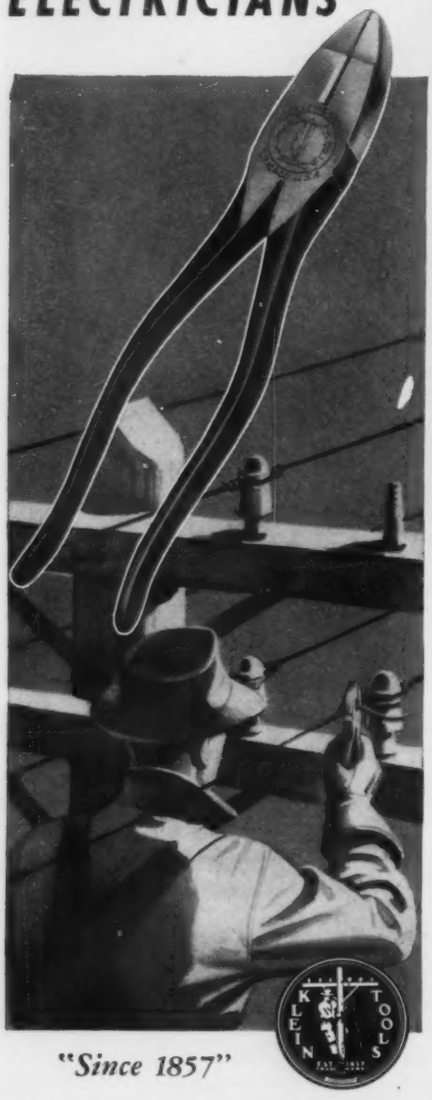
STORM AFTER STORM lashed the West Coast through January, but when a breather at month's end permitted checking up, it was found utilities suffered remarkably little damage. All work at Shasta Dam (above) ceased when the swollen Sacramento River overflowed the diversion channel, flooded the powerhouse area. Western Oregon suffered the worst blow in 10 years, a 90-mi. gale. There were scattered, short blackouts, many service calls, but little major damage to any systems

● REGISTRATION OF ENGINEERS in California is a subject on which engineering societies there are polling opinions of their memberships. Purpose of the polls is to determine whether engineers are for or against a proposed engineering profession act. If engineers say they are, the societies propose to exercise what influence they can in moulding a possible registration and licensing bill prior to its presentation to the California legislature. Some form of licensing is now in effect in about 38 states.

MUNICIPAL SUPERS TO ENLARGE FIELD

The Washington State Assn. of Municipal Power Superintendents will propose extending their organization to include superintendents of similar systems in Oregon, Idaho and Alaska, according to E. R. Hoffman, Seattle City Light superintendent. He states that the superintendents of the Washington publicly owned distribution systems who propose the extension do not state their purpose, but that the idea originated in cities smaller than Seattle and Tacoma, and is designed to facilitate discussions of mutual problems.

KLEIN . . .
STANDARD WITH ELECTRICIANS



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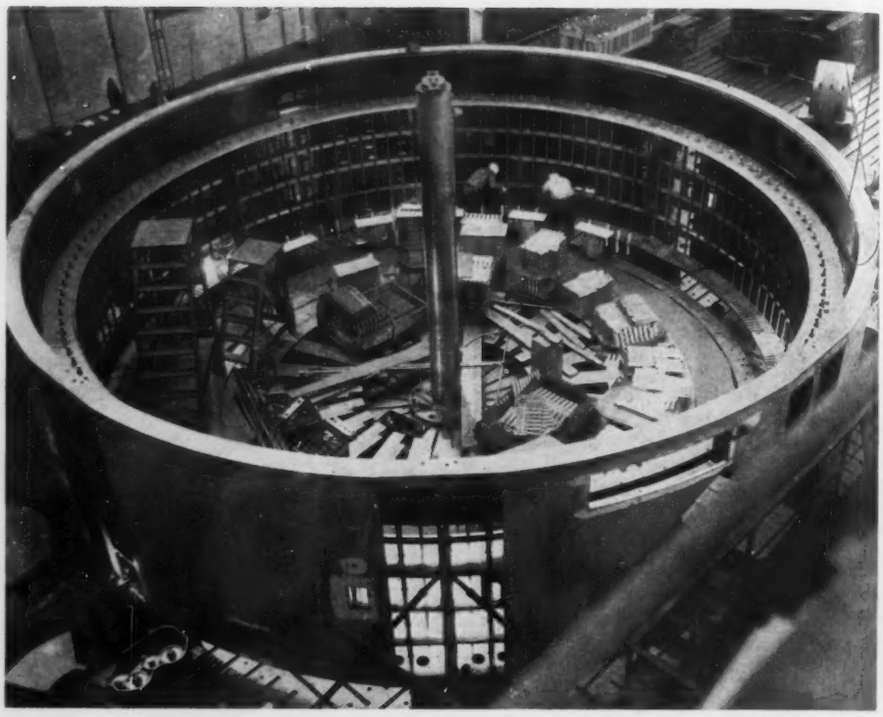


BIGGEST GENERATORS in the world will be the units for Grand Coulee. Here workmen are beginning immense task of inserting 150,000 steel laminations in the stator frame of the 108,000-kva. machine at Westinghouse plant, E. Pittsburgh

LA HAS NEW WATER AND POWER COMMISSIONERS

Deadlocked for months over personnel of the Los Angeles Board of Water and Power Commissioners, Mayor Fletcher Bowron and the city council settled their differences with the appointment and confirmation last month of three new commissioners. They are Clinton E. Miller, Edward A. Dickson and C. Clarke Keely. They bring the commission up to full membership of five.

Miller is a realtor, a University of California graduate and former president of the U.C. Alumni Assn. He was formerly president of the Los Angeles Realty Board and vice-president of the California State Chamber of Commerce.

Dickson is president of the Western Federal Savings & Loan Assn., is a regent of the University of California and was at one time publisher of the Los Angeles *Express*.

Keely is a civil engineer, a graduate of Yale and the Massachusetts Institute of Technology. He is a member of ASCE.

● READY TO SERVE CHARGES would be replaced by rates based strictly on consumption as shown by meter if the House of the Colorado State Legislature were to adopt a proposal submitted there last month by Representative W. G. David, Democrat of Denver.

● PUD Commissioners having approved a tax plan in principle, will through their association, recommend that the Washington State Legislature provide for taxing the gross earnings of districts.

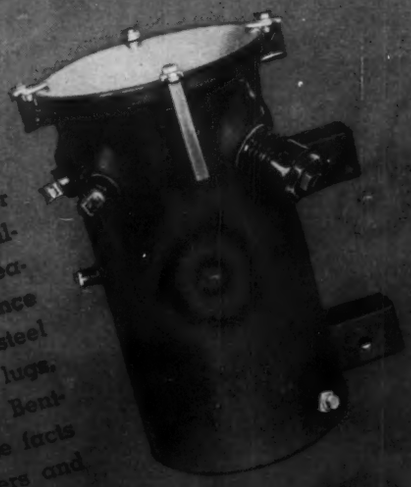
U.S.A. ENGINEERS' DISTRICTS COMBINED

The Portland and Bonneville Districts of the North Pacific Division, U. S. Army Engineers, are now consolidated under Lieut. Col. C. R. Moore, Portland district engineer, according to announcement by Col. Richard Park, division engineer of the North Pacific Division. Major R. H. Elliott who has been district engineer at Bonneville for 16 months has been ordered to Fort Belvoir, Va., to train engineer draftees.

Capt. R. E. M. Des Islets, who was Major Elliott's executive assistant at Bonneville, will remain in charge of the Bonneville sub-office. Most of the administrative assistants of the former Bonneville district will likewise remain there.

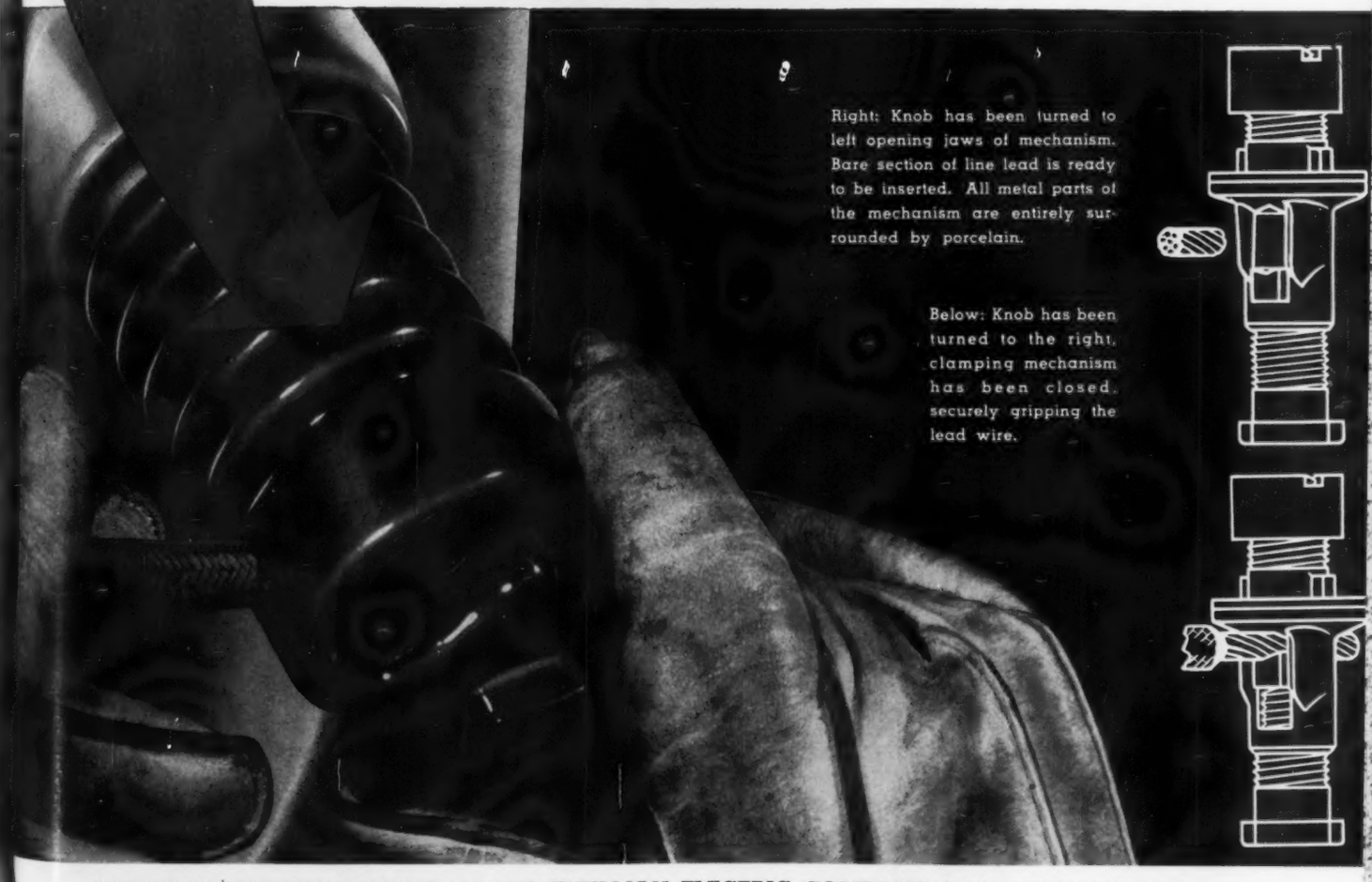
Colonel Park explained the consolidation is in line with similar moves elsewhere, releasing engineer officers for national defense work elsewhere.

NEW KUHLMAN "QUICK-GRIP" PRIMARY BUSHINGS SAVE TIME, INSURE POSITIVE CONNECTIONS



The new Quick-Grip primary bushing is one of the more recent improvements on Kuhlman distribution transformers. By turning the knob at the end, a clamping mechanism, entirely surrounded by porcelain, opens or closes. Thus by a twist of his wrist the lineman can release or insure a perfectly secure grip on the line lead. • Kuhlman distribution transformers embody many other features which add to their life and reduce maintenance costs such as, 1) tanks formed from copper bearing steel and porcelain enameled, 2) "Mogul-type" lifting lugs, and, 3) the widely publicized Kuhlman Patented Bent-Iron core. • It will pay you to write for complete facts about Kuhlman power or distribution transformers and Kuhlman line regulators.

KUHLMAN ELECTRIC COMPANY, BAY CITY, MICH.



Right: Knob has been turned to left opening jaws of mechanism. Bare section of line lead is ready to be inserted. All metal parts of the mechanism are entirely surrounded by porcelain.

Below: Knob has been turned to the right, clamping mechanism has been closed, securely gripping the lead wire.

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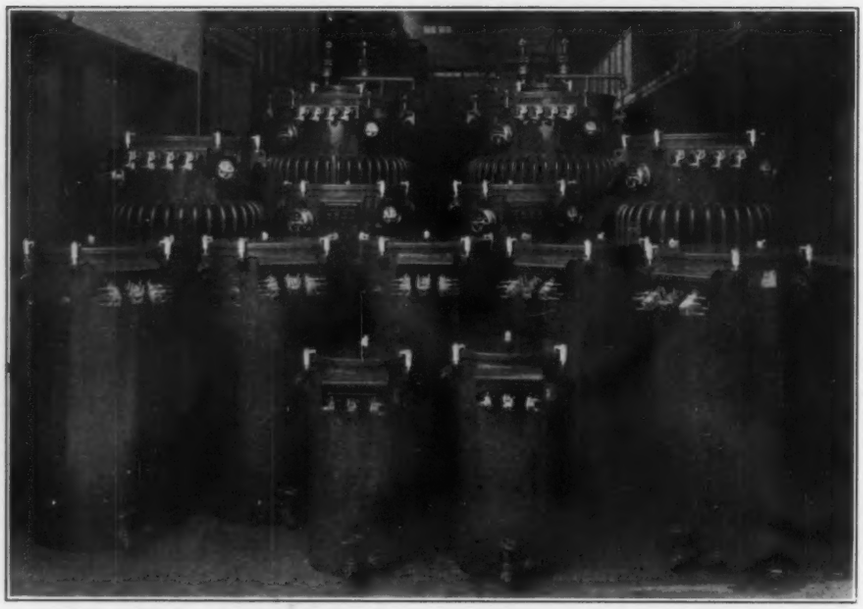

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G.C.A.
Lamp Replacers
Lamp Base Removers
Cartridge Fuse Tongs
Switch Hooks
Send for Catalogue
We have been making safety tools for 24 years
THE G. C. A. Manufacturing Co.
Pittsfield, Mass.

PUD's SEEK AID IN BUYING PROPERTIES

Six representatives of Public Utility Districts in Oregon and Washington in the territory served by Pacific Power & Light Co., meeting in Pasco, Wash., Jan. 15, brought resolutions from their boards requesting the Bonneville-Grand Coulee Power Administration to represent them in an attempt to acquire the company properties within their respective districts.

These districts were Hood River and Wasco in Oregon; Franklin, Benson, Klickitat and Yakima in Washington. Skamania County PUD in Washington did not bring a resolution but indicated its willingness to go along with the others. The central Oregon District, comprised of parts of Deschutes, Crook and Jefferson Counties, was not represented at the meeting.

Acquisition under the proposed arrangement would be by purchase of the entire company properties by the Bonneville-Grand Coulee Administration using RFC funds, and the subsequent re-sale by the Administration to the several PUDs of those properties needed by the PUDs for their own operations. That portion of the company's properties not covered by PUDs, or not needed by them, would presumably be held and operated by the Administration.

The method was offered as an alternate to the one proposed last month by John Nuveen & Co. its associates, which contemplated a similar deal by private financing. Under that deal, that part of the company's properties not saleable to the PUDs would be owned and operated by the Columbia Valley Public Power Corp., a non-profit corporation composed of the PUDs affected.

● PUD IN WHATCOM COUNTY, Wash., is temporarily in abeyance through failure of the PUD Commission to dispose of its $5,500,000 revenue bonds for purchasing Puget Sound P & L property. An exclusive option to purchase was held by John Nuveen Co. of Chicago and has expired. The next step awaits developments in pending negotiations involving the Bonneville Authority and the entire Puget Sound system.

● THE GRAYS HARBOR PUD, Aberdeen, Wash., has taken over the properties of the Twin Harbors Electric Co. on an agreed price of $59,662 and will immediately start work of rehabilitation estimated to cost at least $40,000. The service now extending to Westport, Graylands and other beach points will also serve Tokeland in the near future.

6 GOOD REASONS *for considering this* L-M ROUND-WOUND TRANSFORMER

L-M engineers announce a new distribution transformer in which is employed a wound core and round coils . . . a transformer, which because of its construction and performance characteristics, will increase your revenue, decrease your operating expense, and improve your customer relations . . . Six good reasons for considering it are listed below.

It is the only transformer **that combines two round coils wound directly onto a wound core without disturbing the core after it has been annealed.**

It is a distinctly new transformer **in that it provides for improved regulation at all power factors due to lower reactance, lower resistance and lower impedance.**

It is a better transformer **in ratio of losses as a result of lower copper losses and lower total losses.**

It is a transformer of uniformly longer service life **because of uniform high impulse strength, greater mechanical strength of round coils and improved time-temperature characteristics.**

It is a transformer of uniformly lower exciting current **which is made possible through the elimination of air gaps in the core.**

It meets the new E. E. I. and N. E. M. A. standards **for distribution transformer construction in every detail.**

• • •

The L-M ROUND-WOUND transformer is in production in single phase, 60 cycle ratings of 1½ to 25 Kv-a, 7620 volts and below, with prompt deliveries on 1½ to 7½ Kv-a.

The development of the L-M ROUND-WOUND transformer is already acknowledged to be one of the most important in the history of distribution transformers. The Line Material Company offers you the first detailed information regarding this transformer in the bulletin LMB-41161. Write for it.

LINE MATERIAL COMPANY

A Complete Line of Electrical Transmission Distribution and Street Lighting Equipment

General Offices: Milwaukee, Wisconsin

Plants: South Milwaukee, Wisconsin • East Stroudsburg, Pennsylvania • North Birmingham, Alabama
Oneida, New York • Zanesville, Ohio • Gary, Indiana • Barton, Wisconsin • Toronto, Ontario, Can.

Sales Offices in thirty-seven cities . . . Warehouses in fifty-one cities

LM

FORGED-IN STRENGTH

BURNDY SERVIT

BURNDY ENGINEERING CO., INC.

On the West Coast It's—

Condon & Young, Inc., 357 S. Hill St., Los Angeles, Calif.
C. E. Ingalls, Rialto Bldg., San Francisco.
Fred W. Carlson, 307 Wall St., Seattle, Wash.
Riter Engr. Co., Kearns Bldg., Salt Lake City.

Speed Up ANCHORING JOBS ★

EVERSTICK ANCHORS...

Speed and ease of installation are features that crews and engineers appreciate in Everstick Anchors. Nut housing locks, anchor firmly on rod—entire unit is installed and expanded in a minimum of time. *Write for new bulletin.*

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

FLUORESCENT LIGHT is used beneath the marquis of the clubhouse at new horse-racing track, Albany (near Oakland), Calif. For complete story, see p. 89

LA BUREAU WILL EFFECT A RATE REDUCTION

Rate reductions expected to save Los Angeles consumers $1,000,000 annually beginning May 1, were made by the municipal Bureau of Power & Light Jan. 14. All classifications of business will share in the rate slash, which includes an estimated $150,000 saving in street-lighting charges.

Economies effected by the Department of Water and Power during 1940, following an engineering and operating study by Ford, Bacon & Davis, are credited with the rate reduction which, according to Mayor Fletcher Bowron, does not include anticipated savings this year through bond refinancing or an estimated $1,000,000 saving from the city's new Boulder Dam contract.

The Bureau's estimate of 1941 power sales is $31,600,000. The Board of Water and Power Commissioners says operating expenses in the first five months of fiscal 1939-40 were 43% of gross income, as compared with 47% in 1938-39.

ELECTRIQUIZ

(see p. 98)

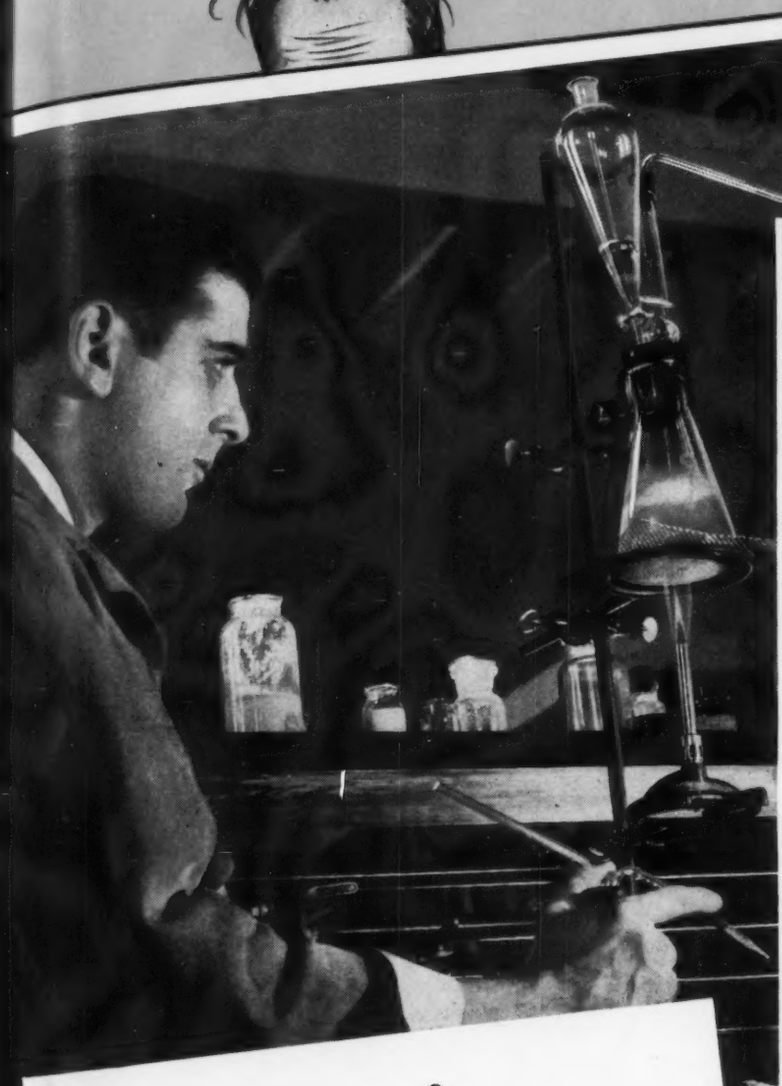
1. False. When the cost of financing the installation and re-lamping are added to the cost of electricity, the fluorescent figure over a term of years is likely to be greater than incandescent.
2. False. Fluorescent lamps seldom can be used comfortably in offices or stores unless shielded.
3. False. The light output of fluorescent lamps installed in low temperatures, such as are found in refrigerators, is materially reduced.
4. False. A fluorescent tube is opaque to light. Light cannot be reflected back through the tube. Lighting equipment which traps too much of the light behind the lamps is undesirable.
5. False. Nela Park is G-E's lighting headquarters in Cleveland, Ohio.
6. True. The stored energy in flashlight cells would cost approximately $50 per kwh.
7. True. Dr. P. W. Sorensen of the California Institute of Technology, Pasadena, is president of AIEE.
8. False. Westinghouse sponsors "Musical Americana." G-E's program is "The Hour of Charm."
9. True.
10. False. The light from a 100 watt lamp is approximately equivalent to that from 162 candles.

W. P. Bear, PG and E, San Francisco; A. Frank Ayres, Nevada-Calif. Electric Corp., Riverside, and A. L. Laws, Southern California Edison Co., Los Angeles, are the contributors to this month's Electriquiz.

"WHO AM I?"

Answer to "Who Am I?" (See page 98): A. E. Strong.

This man GETS IN PEOPLE'S HAIR



To see that you get the best cable possible he checks on all incoming materials...accepts only those that meet *Anaconda's Rigid Standards*

PERSONALLY, he's "tops" but when it comes to cable materials he's even harder to please than he is to fool. His eye is keen, his knowledge sound, his standards severe and he applies them all, accepting and rejecting the materials used in Anaconda Wire and Cable.

His task, and that of the other trained engineers and chemists entrusted with Anaconda research, is to protect quality...to insure that every length of wire and cable measures up to the name behind it...which means —flawless as the skill, science and long experience of Anaconda can make them.

ANACONDA
from mine to consumer

40865

• • •

A Wire and Cable for Every Electrical Requirement

The Anaconda line is complete, including standard and special power cables, rubber-covered wire, magnet wire and coils. Each product has benefited from Anaconda's continuous development and research program.

USE MODERN IMPROVED **Anaconda Wire & Cable**

ANACONDA WIRE & CABLE COMPANY, General Offices: 25 Broadway, New York City; Chicago Office: 20 North Wacker Drive
A Subsidiary of Anaconda Copper Mining Company. Sales Offices in Principal Cities

ALL KINDS
of SMALL
TRANSFORMERS

—in the JEFFRIES line

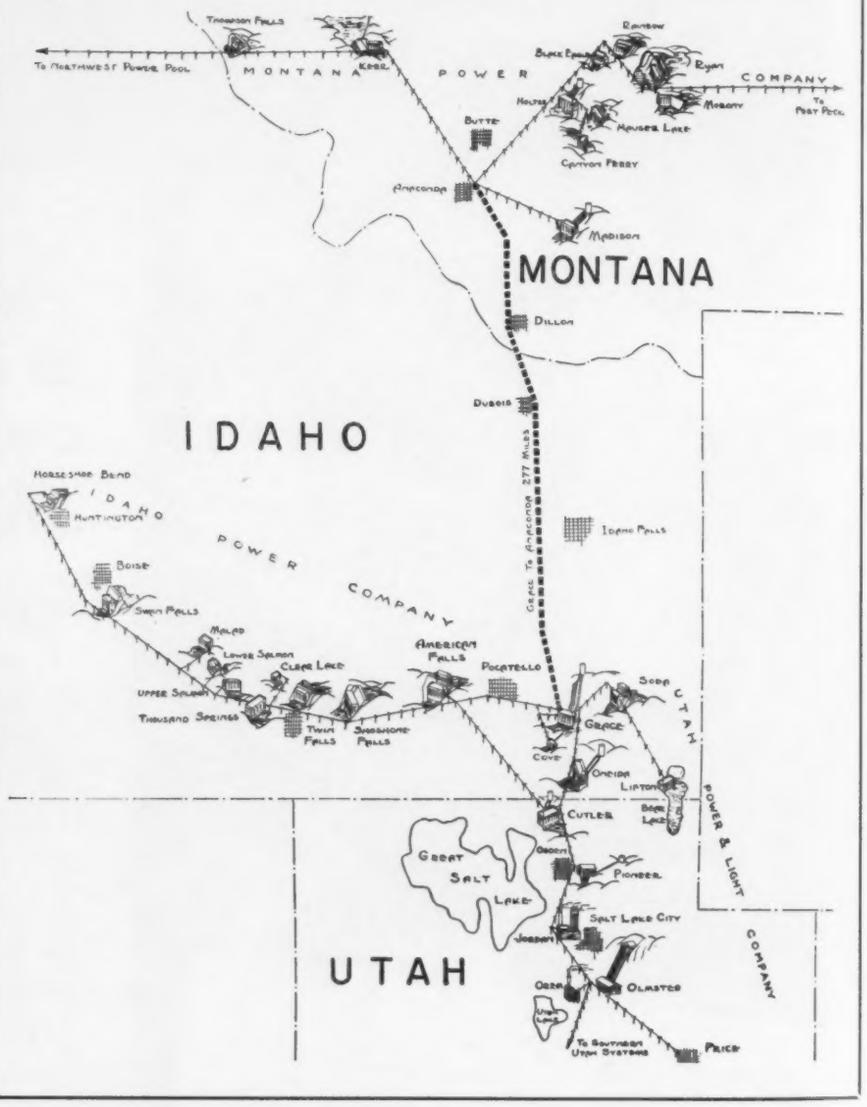
Practically all your small transformer needs are supplied by the Complete Jeffries line. We have specialized for years in providing transformers to **exactly** match your requirements. If not in our regular line, we build to meet your specifications—in a hurry!!

Minimize your voltage losses. Specify scattered transformers to eliminate duplicate conduit runs, and save on power costs.

JEFFRIES TRANSFORMER COMPANY
1710 E. 57th St. Los Angeles, Calif.

THREE-SYSTEM TIE

Here is how Idaho, Montana and Utah are being linked for interchange, hence improved availability of power throughout the three states. See index p. 44



POWER FOR WAR CONCERNS CANADIANS

Possible use of the power resources of British Columbia to offset a potential shortage of electrical energy for war industries in Eastern Canada is now being discussed at Vancouver. Eastern shortage was indicated in an address by Dr. Thomas Hogg, chairman of the Ontario Hydro-Electric Commission. Howard Green, M. P. for Vancouver-South, believes there are huge potential reserves of power in B. C. which should be harnessed to Canada's war effort.

An official of B. C. Electric admitted that British Columbia enjoys a surplus of electricity. He said the surplus for the B.C. mainland system amounts to 25,000 hp. since the company installed a new 47,000-hp. unit last year. He saw no reason why new units could not be installed in eastern cities before war industries suffer from a power shortage for war industries.

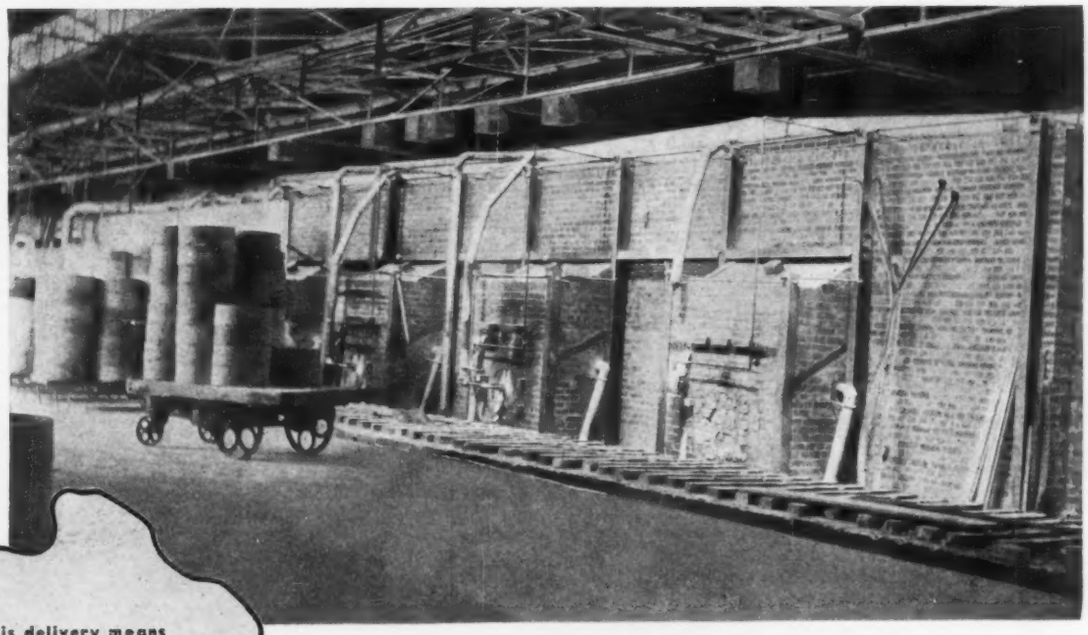
● EXAMINATION OF B C ELECTRIC Railway Company's financial and physical assets by the British Columbia Public Utilities Commission is nearing completion, it was learned, and the results may be used in a possible revision of light and power rates on the B C coast. After accountants and engineers have finished their reports the commission will call public hearings in Victoria and in Vancouver to sound the opinion of consumers and public bodies on the electric power situation.

ACCURATE ILLINOIS KILN FIRING
Prevents Strains IN PORCELAIN

• During the firing, a strict watch must be kept on the movement of the cars of porcelain as they slowly travel through the kiln. A continuous record is kept, showing the exact position and the exact degree of heat through which the car is passing.

No sudden temperature changes can occur because modern precision instruments control the various degrees of heat as the cars of porcelain pass through the kiln.

The Illinois organization is fully equipped with modern machinery to insure balanced Insulators—high dielectric strength—high mechanical strength — exact dimensions.



CENTRAL LOCATION INSURES PROMPT DELIVERY anywhere in U.S.

Illinois delivery means that your production schedules never suffer because of delay in getting your Illinois Insulator shipments—your order comes to you as promptly as you specify it—Illinois is geared for speed as well as quality. *Send for latest catalog.*

Standardize on

ILLINOIS

FOR TOP QUALITY AND EXACT DIMENSIONS——

ILLINOIS ELECTRIC PORCELAIN CO.
MACOMB, ILLINOIS

YOU ASKED FOR PROTECTION

THESE FEATURES MAKE TRI/CLAD THE MOTOR YOU ASKED FOR

1 One-piece, cast-iron frame and rigid cast-iron end shields protect the motor against external blows and accidental abuse.

2 Enclosed construction protects against entry of falling objects and dripping liquids; keeps chips and the like from vital motor parts.

3 Low-velocity, double-end ventilating system provided by fans cast integrally with rotor winding keeps the motor running cool and prolongs insulation life.

4 New winding methods give shorter end turns, reduce the number of internal connections, and improve characteristics.

5 Features that add to convenience in installing include a stator which can be assembled with the conduit box on either side, and four-position end shields.

6 Synthetic-resin insulating varnish, with exceptional bonding strength and high resistance to heat, bonds the conductors together and prevents movement of the windings.

7 Steel-shell bearing linings with hard-tin-babbitt are of new design and have a method of grooving which provides positive lubrication for either direction of rotation.

8 New and simple ball-bearing mounting assures correct alignment and exclusion of foreign materials. Easily cleaned and regreased by means of the G-E pressure-relief system.

9 Big, roomy, four-direction conduit box is quickly removed from its base to give unrestricted working space for making connections. Leads are flexible and clearly marked.

10 Formex wire—the toughest magnet wire ever developed—assures a continuous dielectric film under the most severe conditions. Formex is highly resistant to abrasion, moisture, varnish solvents, and heat aging.

11 End windings are coated with Glyptal No. 1201 red, providing a tough, hard finish that is highly resistant to heat, moisture, oil, and abrasion.

12 One-piece cast-aluminum rotor winding with fans cast integrally is practically indestructible, has no joints, and gives a cool-running low-inertia rotor.

13 All laminations, both in stator and rotor, are annealed for low iron losses and uniform characteristics. Special rotor treatment improves operating characteristics.

BUILT FOR PROTECTION FIRST .... TO LAST

THE Tri-Clad motor is a completely new design, and it's built to industry's own specifications. After five years of field investigation to find out what you wanted in a motor, G-E designers started afresh. They took full advantage of new synthetic insulating materials, new close-tolerance manufacturing methods, and new, better ways to utilize active materials. They built a greatly improved general-purpose motor with *protection* as the top-ranking "plus" factor. We call this motor "Tri-Clad" because it gives you extra protection in three basic respects.

No other standard motor, we believe, has ever met the general-purpose requirements of industry with so well-balanced a combination of performance characteristics, convenience features, and provisions for protection. As a safeguard against production interruptions, as a prime factor in lowering costs, as an extra increment of value on any machine, you'll find that the Tri-Clad motor means extra profit protection, too.

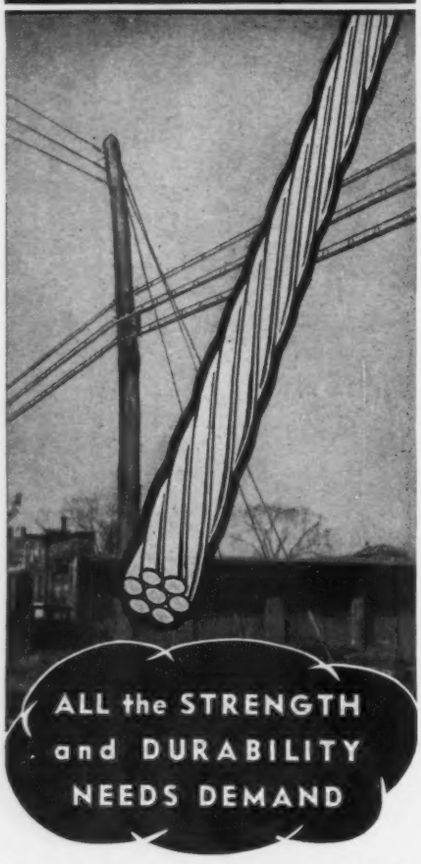
Sizes now available are 1, 1½, 2 and 3 hp—larger sizes later. General Electric, Schenectady, N. Y.

*Reg. U.S. Pat. Off.

GENERAL ELECTRIC

750-25

Crapo
GALVANIZED STEEL
STRAND
Guy and Messenger



ALL the STRENGTH and DURABILITY NEEDS DEMAND

The superior tensile strength that only steel can give . . . . the ruggedness to withstand severe punishment . . . . the ability to outlast normal needs . . . All these are combined—with outstanding economy—in *Crapo* Galvanized Guy and Messenger Strand.

Long life and low maintenance costs are characteristic of this time-tested product. Heavy, ductile, tightly-adherent zinc coatings, applied by the *Crapo* Process, provide lasting protection against corrosion. The inherent strength and endurance of the steel makes for dependable, maintenance-free service.

Crapo Galvanized Steel Strand is readily available in all standard grades and sizes from representative jobbers.

Crapo Galvanized Products also include *Crapo* HTC-130 and HTC-80 Steel Conductors (Solid and Stranded 3-Wire), Construction Wire, Tie Wire and Ground Wire.

INDIANA STEEL & WIRE CO.
MUNCIE, INDIANA

CONNECTOR MAKERS ENTER CONSENT DECREE

Uncertainty over various business practices, particularly as applied to trade associations, has been partially dispelled by a consent decree entered into by electrical connector producers and the Department of Justice in the U. S. District Court for the southern New York district. Nine manufacturers, their trade institute and Frank H. Baxter Associates were signatories.

In general the decree enjoins all signatories from entering into any program or other artificial arrangement to "raise, depress, establish, maintain or adhere to prices to be charged" or conferring for such purposes. It does, however, permit a number of business practices having widespread benefits to all industries and trade associations. These include the collection and dissemination of reports on consummated sales and prices obtained; the auditing of industrial statistics to insure completeness and accuracy, and the issuance and circulation of prices, terms and conditions of sales if such information is "readily, fully and fairly available to the purchasing and distributing trade" at the time of their initial dissemination.

Nothing under the decree is construed to prohibit lawful conduct of one or more of the signatories authorized or permitted under the patent laws.

The decree applies to the following concerns and their officers: Jasper Blackburn Products Corp., James B. Kearney Corp., W. N. Matthews Corp., Burndy Engineering Co., Inc., Reliable Electric Co., Line Material Co., Fargo Manufacturing Co., H. B. Sherman Manufacturing Co., Electrical Solderless Connector Institute and Frank H. Baxter Associates.

● TWO OFFICES FOR ONE MAN, if they be those of PUD commissioner and county commissioner, are out, according to an opinion by Attorney General Smith Troy, of Washington. However, he did state that a person could hold the offices of school director and county commissioner at the same time. The opinion was for Prosecutor R. L. Ponder, of Lewis County, who said a PUD commissioner had been elected county commissioner.

● ACCORDING TO A RULING by Attorney-General Smith Troy at Olympia, Wash., public utility districts have authority to construct power or water lines on city streets or alleys without securing a franchise from the city administration. The ruling stated that cities can not charge the PUDs for the right to install these systems.

● DENVER CONSUMERS WILL SAVE nearly $200,000 this year as the result of a Public Service Co. of Colorado rate reduction effective Jan. 1st. The new rate, involving 60,000 domestic users and designed to reduce bills above $2.00 a month, is 5 c. per kw. for the first 40 kw.-hr., 3½ c. for the next 40, and 2 c. for all over 80, minimum charge 75 c.

● SPOKANE'S MOVE TOWARD MUNICIPAL POWER now takes the form of a petition by the Spokane Municipal Power & Light Assn. endeavoring to have the power issue brought before Spokane voters in March.

Edison Tax is 1/5 Revenue

Twenty and a half cents out of every dollar of revenue collected by Southern California Edison Co. from its customers in 1941 will be paid to some governmental agency in the form of taxes. This figure is brought out in a study made by the California Railroad Commission looking toward possible rate reductions. The commission's informal investigation is a regular, annual activity which takes the place of drawn out formal rate proceedings. Preliminary commission figures indicate there is some possibility of a rate reduction. Company officials have made no statement.

● CALIFORNIA PUBLIC SERVICE CO. will acquire electric and water properties of Central Mendocino County Power Co., which serves Willits, Calif., and vicinity for $235,000 under a plan recently approved by FPC.

Small Plant for Calif.

California-Pacific Utilities Co., serving Susanville, Calif., plans installation of a 1,500-hp. diesel and butane plant this year for standby service.

● AN 8-MILL RATE for power for the Seattle Transit System has been proposed by Seattle City Light. Present rate is 1 c. per kw.-hr., and the only point of issue is whether the rate will apply as of Jan. 1st or become effective when City Light has completed substation so that power of the Puget Sound P & L need no longer be used.

● FREE LIGHT AND POWER was presented for the sixth consecutive year to the citizens of Grand Forks, B. C., for the two-week period around Christman and New Year's as a Christmas present from the municipally-owned hydro electric plant.

RECORD-BREAKING CABLE job was th Okonite submarine installation by Puget Sound P&L at year's end. On the job are: (L to R) William Van Heek, construction foreman; Ralph Cook (upper) asst. supt., central division; Chas. F. Terrell, company operating manager; Geo. C. Sears, gen. supt., power supply div., and Magnus T. Crawford, asst. chief engineer

● DRAFTSMEN WANTED. Failure of a civil service examination last fall to produce enough eligibles to meet the demand of the national defense program has led the Commission to reannounce the examination and accept applications until the end of this year. Salaries range from $1,620 to $2,600 per year.

● TURBINE BIDS FOR BONNEVILLE were opened Dec. 18. Bid upon were four units, to be delivered within 2 years plus 70 days. They are 74,000-hp. units and will complete the Bonneville installation of 10 machines. S. Morgan Smith bid $2,689,100 for the turbines; Woodward Governor offered two schedules for governor equipment, bid A $258,820, and bid B $214,064; Baldwin Locomotive bid $2,964,000 for the turbines and $258,820 for the governors.

REA

MALHEUR COOPERATIVE ELECTRIC ASSN., Vail, Ore., will use a $17,000 allotment to build 18.5 mi. of line to serve some 50 members. Previous allotments total $210,000.

STONEWALL ELECTRIC CO., c/o Albuquerque Gas & Electric Co., New Mexico, has received an allotment of $216,000 to build 282 mi. of line to serve 462 members.

STONEWALL ELECTRIC CO., Tucson, Ariz., has been allotted $35,000 to build 41 mi. of line to serve 60 customers in Pima County. Previous allotment $65,000, to serve 145 members.

MOUNTAIN EMPIRE ELECTRIC COOPERATIVE, INC., Campo, Calif., was allotted $20,000 to build 19 mi. of line to serve 115 members in San Diego County. Previous allotment $114,000 to serve 240 members.

HIGH LINE ELECTRIC ASSN., Holyoke, Colo., is in receipt of $116,000 to build 190 mi. of line to serve 295 members in eastern Colorado. Previous allotment $277,000 to build 286 mi. of line to serve 628 members.

EMPIRE ELECTRIC ASSN., INC., Dove Creek, Colo., will make member-service extensions on an allotment of $16,000. Previous allotments total $97,000.

LONG VALLEY POWER COOPERATIVE, Lake Fork, Idaho, will build 113 mi. of line to serve 323 members in Valley County on an allotment of $119,000.

FALL RIVER RURAL ELECTRIC COOPERATIVE, INC., Ashton, Idaho, has been allotted $52,000 to build 60 mi. of line to serve 119 members. Previous allotments total $182,000.

SUN RIVER ELECTRIC COOPERATIVE, INC., Fairfield, Mont., has been allotted $155,000 to build 175 mi. of line to serve 301 members. Previous allotments total $327,500.

LOWER YELLOWSTONE RURAL ELECTRIFICATION ASS'N., Sidney, Mont., will build 27 mi. of line on a recent allotment of $32,000 to serve 92 new members. Previously allotted was $144,600.

MISSOULA ELECTRIC COOPERATIVE, INC., Missoula, Mont., will serve 61 members with 34 mi. of line to be built on an allotment of $35,000. Previous allotments total $222,000.

ORCAS P & L CO., East Sound, Wash., has been allotted $310,000 to build and acquire 158 mi. of line to serve 774 members. Previous allotments total $166,000.

INLAND EMPIRE RURAL ELECTRIC, INC., Spokane, Wash., will build 700 mi. of line, serve 1,066 members on a new allotmeent of $566,000. Previous allotments total $1,564,000 and involve 3,750 members.

STEVENS COUNTY ELECTRIC COOPERATIVE, INC., has been allotted $265,000 to build and acquire 222 mi. of line to serve 608 members. Preevious allotment $326,000.

PEOPLE

made this news

ROSENBLATT

WESTINGHOUSE MAKES FOUR PROMOTIONS

A series of shifts in Westinghouse personnel brings promotions and extra duties to Westinghouse men in San Francisco, San Diego and Salt Lake City. The promotions are:

Girard B. Rosenblatt, San Francisco, industrial manager for the Pacific Coast district—the added job of marine manager for the district; Robert M. Campbell, Oakland, assistant manager of the agency and specialty division—to San Francisco, as manager of that division for the district; Frank E. Bodine, Salt Lake City sales force—to manager of sales for the office, and William B. Bustard, Los Angeles sales force—to San Diego, as manager of sales for that area.

Rosenblatt graduated from Columbia University in 1902, as an electrical engineer, and joined Westinghouse at East Pittsburgh. He came West in 1905, first to Butte, Mont., then to Salt Lake City. In 1925 he was transferred to the San Francisco office and was given the district industrial managership in 1928.

Campbell is an electrical graduate of the University of California, 1928, and was assigned to the San Francisco office in 1930, after two years at East Pittsburgh. He joined the agency and specialties division in 1938, was made assistant manager in 1939.

Bodine is a native of Colorado, where he graduated from the State Agricultural College in electrical engineering in 1926. He did the shift at East Pittsburgh, was then assigned to the Salt Lake office, where he has been active for the past 12 years.

Bustard succeeds Ronald T. Strong, who has been called to active duty with the Navy. Bustard is a USC man, electrical engineering, 1926. He has served the company in sales capacities in East Pittsburgh, Phoenix and Los Angeles.

CAMPBELL

BODINE

● SAFETY—At the conclusion of the Western Safety Conference, at Phoenix the delegates from Alaska, Hawaii and 11 western states petitioned the legislatures of their respective areas to provide funds for traffic safety illumination.

HERE ARE SOME ELECTION RETURNS

Norman A. Hayes, sales manager of Stubbs Electric Co., Portland, Ore., is the new president of the Portland Electric Club being installed in January to succeed Corbett McLean, Northwestern Electric Co.

Leonard A. Kallen, long associated with the industry in Portland, was advanced from second to first vice-president, and O. L. LeFever, Northwestern Electric Co., was elected second vice-president. Other new officers are John Novak and Clause R. Groth, both of Pacific P & L Co., secretary and treasurer respectively; George Schulz, Garland-Affolter Co., sergeant-at-arms. O. B. Coldwell, Portland General Electric Co., was retained as a director, and Charles Canada, G-E, was added to the directorate. McLean automatically becomes a director for one year.

● UTAH CHAPTER, IAEI, has new officers: S. Truman Ferry, assistant Salt Lake City electrical inspector, chairman, who succeeds L. John Christensen; J. Hyde Stayner, supervisor of the meter department, Utah P & L Co., vice-chairman. Ray L. Davis, engineering department of the Utah P & L, was re-elected secretary.

● W. C. MULLENDORE, executive vice-president of the Southern California Edison Company, Los Angeles, was elected vice-president of the Los Angeles Chamber of Commerce Jan 8.

● LORENZO RICHARDS, president and general manager of Boyle Furniture Co., Ogden, Utah, was elected president of the National Retail Furniture Assn. Jan. 7.

BUSTARD

1.

WASTE OF INSTALLATION TIME

With the combination starter you have only one piece of equipment to install and wire.

2.

SACRIFICE OF VALUABLE SPACE

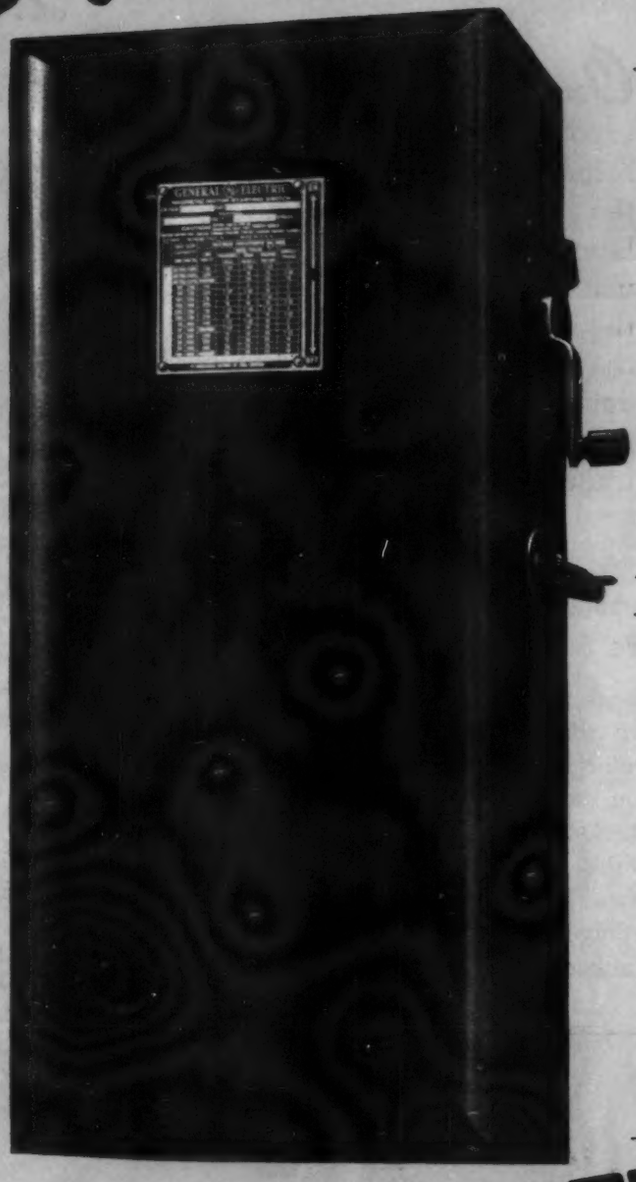
The combination starter takes less space than separate devices require. It can be mounted right on the machine.

3.

DANGER FROM "HOT" PARTS

You can't touch live parts on the combination starter. The switch must be OFF before the cover can be opened.

3 THINGS YOU'LL AVOID



CIRCUIT SWITCH PLUS SHORT-CIRCUIT PROTECTION

MAGNETIC STARTER

Three things any plant would gladly do without! The best part of it is, this attractive G-E combination starter not only eliminates the drawbacks of separate devices, but it costs you less than separate devices, installed.

We'd like you to have our new publication GES-2456, "More for Your Control Dollar." It shows how others are money ahead because they use G-E combination starters for the motors they install and the machines they buy. Write for your copy. General Electric, Schenectady, N. Y.

IT'S A PERFECT
RUNNING MATE
FOR YOUR
G-E *TRI/CLAD* MOTOR

with G-E COMBINATION STARTERS

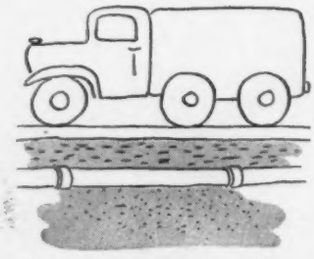
GENERAL ELECTRIC

676-29

SEVEN FACTS YOU CAN DISTRIBUTION

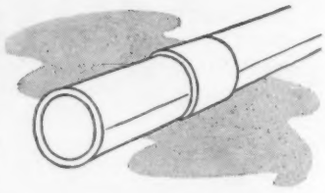
ON ALL TYPES of duct systems—exposed or enclosed, above ground or below—J-M Transite Ducts provide the advantages of economical installation, reduced operating costs, lower maintenance. Briefly listed below are the reasons why utilities throughout the country are finding Transite Conduit and Transite Korduct the logical materials for dependable, trouble-free transmission and distribution lines.

1. Transite Ducts Are Strong!

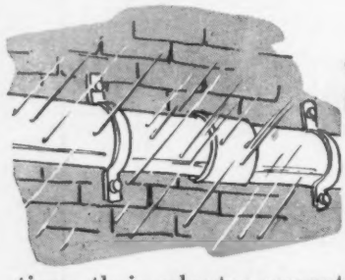


On underground lines, you save the expense of a protective casing when you use Transite Conduit. So strong it needs no concrete envelope, this durable duct holds its true form under sustained earth loads and traffic pressure . . . substantially reduces installed costs, particularly where a small number of ducts per trench is involved.

2. Transite Ducts Can't Rot!



Made of asbestos and cement, Transite Ducts are 100% inorganic . . . completely proof against rot or decay. Being nonmetallic, they are also immune to electrolysis. No protective treatment is required to assure long, trouble-free life in underground service.



3. Transite Ducts Resist Corrosion!

Maintenance costs stay permanently low when you install Transite Ducts. In exposed locations, their asbestos-cement composition effectively resists weather and corrosive fumes and gases; underground, they offer unusual resistance to the destructive action of aggressive soils.

4. Transite Ducts Cost Less to Install!

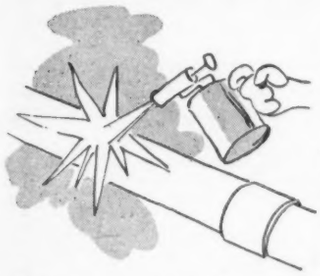
Furnished in long, light lengths, Transite Ducts are handled and assembled easily and economically. Transite Conduit's strength often eliminates

TRANSITE CONDUIT—For use underground without a concrete envelope and for exposed locations.

JM PRODUCTS **Johns-Manville**

USE TO CUT COSTS...

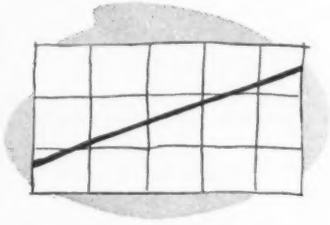
the expense of a concrete envelope. Where "concreting-in" is specified, Transite Korduct's long lengths require fewer spacers, fewer joints. Both make lining up fast and accurate.



5. Transite Ducts Won't Burn!

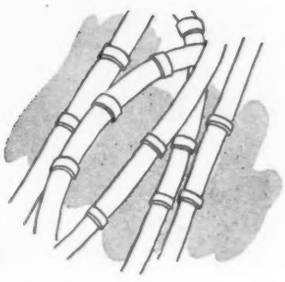
Burnouts have no effect on Transite Ducts. Completely incombustible, they will not generate dangerous gases, fumes or smoke, and provide the equivalent of extra fire-protection between cables. With single conductor, lead-sheathed AC cables, closer spacing may be used, resulting in lower induced sheath voltages.

6. Transite Ducts Boost System Capacity!



Transite Ducts provide an exceptionally high rate of heat dissipation. This means increased system capacity or lower cable-operating temperatures with resultant decreased insulation and I^2R losses and longer cable life.

For full details on how Transite Ducts and other J-M Electrical Materials can help you cut distribution costs, ask for Catalog D. S. 400. Johns-Manville, Los Angeles, San Francisco, Seattle.



7. Transite Ducts Save on Assembly!

A complete line of Transite fittings permits adaptation to varying installation conditions. Curved segments, deflection couplings and sweeps enable easy changes in direction. All are assembled cold . . . machining or cutting is done with standard tools.

Other J-M Electrical Materials

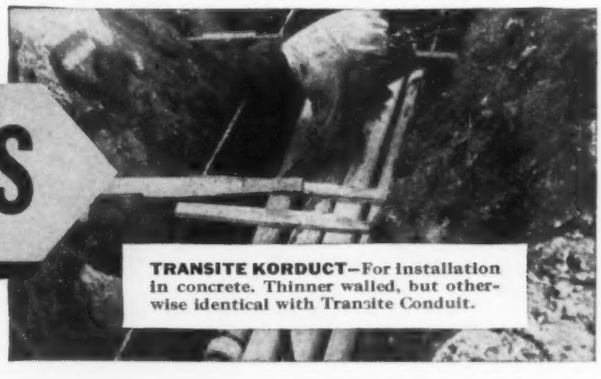
Trancell Cell Structures and Doors are fireproof, light in weight, rapidly and economically erected. Compared with metal, this J-M asbestos product greatly reduces condensation troubles. Because Trancell cannot rust, it never causes shutdowns for cleaning or painting. Compared with concrete, its large, easily handled sheets and dry construction reduce installation cost and its light weight permits housing of equipment in multi-storied buildings without overloading of floors.

Duxseal for duct openings is a plastic, non-hardening putty that forms a lasting, tight seal. Easily worked and handled. Adheres firmly to any duct or metal surface. Unaffected by temperature changes or liquids and gases commonly found in underground cableway structures.

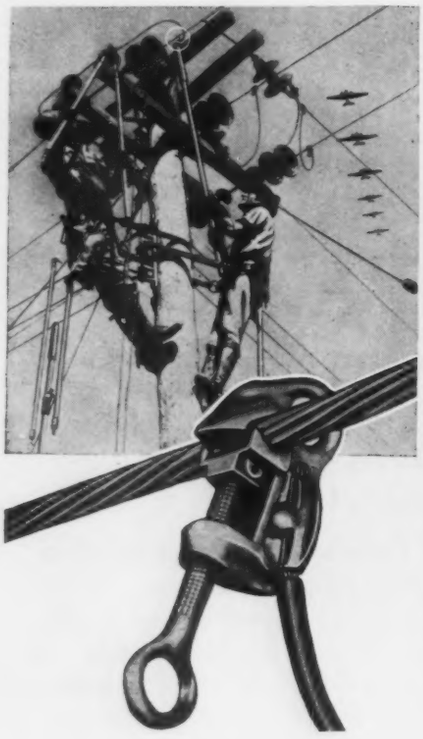
Niagrite-Asbestoment Cable Fireproofing is a combination of asbestos felt and an arc-proofing cement used for many years to protect adjacent cables from communicated damage due to arcs or to oil or gas fires.

Asbestos Ebony for switchboard panels, bus-bar supports, switch bases, etc., maintains its high dielectric strength and insulation resistance in service. Withstands shock and vibration; unaffected by temperature variations; and won't warp or crack.

TRANSITE DUCTS



TRANSITE KORDUCT—For installation in concrete. Thinner walled, but otherwise identical with Transite Conduit.



TAP NEW SERVICE EXTENSIONS WITH

TIPS PERMA-GRIP TAP CLAMPS

Preparedness is a good idea in line construction, too. The use of Tips Perma-Grip Tap Clamps on service extensions prepares the line for quicker, easier maintenance without service interruptions. Build the extensions and tap them in hot with the Grip-All Clamp Stick and Tips Perma-Grip Tap Clamps—made in a variety of sizes for every job. Perma-Grips give you three point positive contacts, proper electrical conductivity, high mechanical strength, and quick easy application.

A·B·CHANCE CO. CENTRALIA MISSOURI

COLGATE TUNNEL, PG and E's 4½-mi. bore, was the particular baby of these three men: (L. to R.) Jack Cooney, superintendent in charge of tunnel construction; Hector Keesling, of engineering staff, and Harry Scott, who was in charge of boring

JACK FROST GETS UNEXPECTED HONOR

Surprised in his own baliwick, A. M. Jack Frost, manager of Agricultural Sales, Pacific Gas and Electric Company, was tendered an unexpected honor at the annual dinner for agricultural power salesman at Davis, Calif. Occasion was the opening dinner at the 13th annual rural electric conference held at the University of California Agricultural College at Davis at which J. R. Tavernetti presided.

Prof. H. P. Walker complimented P G and E on the winning of the Martin Award for the most outstanding job of rural electrification and then surprised A. M. Frost by presenting him a scroll signed by the executives of his company and by the entire agricultural sales staff giving him the credit for the leadership which had made the award possible.

Characteristically, Frost declared it a "case of mistaken identity" and endeavored to return the credit for the achievement to the entire company. R. E. Fisher, vice president in charge of public relations and sales, reiterated the sentiments expressed on the scroll on behalf of the management and complimented Frost.

J. P. Fairbank, Extension Division of U. C., was toastmaster and the speaker of the evening was L. J. Fletcher, formerly one of the teaching staff at Davis and now assistant general sales manager, Caterpiller Tractor Co. Subject of his talk was that salesmen must sell Americans the truth about American distribution so that they will appreciate how effective it really is as compared to the systems advocated to supplant it.

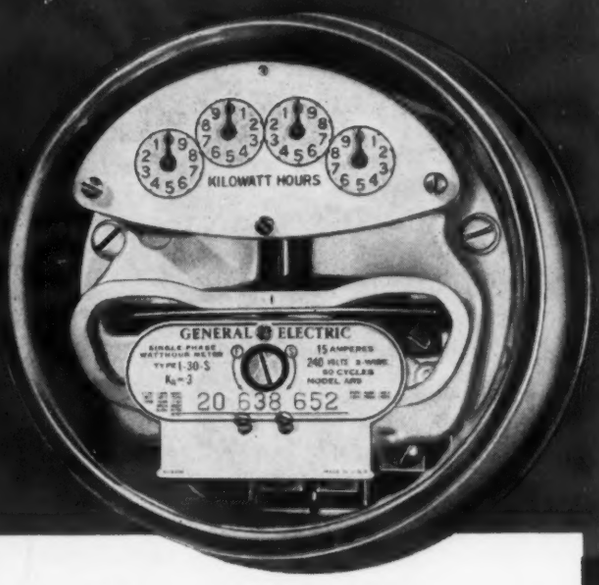
In speaking of communism, he made the comparison to America in the days of the Indians. The country then, with all of the resources it now has, plus all those consumed since then, was peopled by only 1,000,000 Indians and was under totalitarian rule. However, lacking incentive, throughout the ages nothing was done with these resources to improve the country.

● A. E. (Ted) Press, formerly of the customer service department has been appointed credit manager of the Salt Lake Division, P & L Co., succeeding Harry P. Earl, recently named manager of the Associated Retail Credit Men of Salt Lake City.

● E. W. Brown, for ten years Salt Lake City district manager for G-E Appliance and Merchandise Dept., has been transferred to Portland, Ore., as representative of the refrigeration department.

● R. G. Masters, sales manager of Appliance Wholesalers of Oregon, Portland, Philco distributor, won a Philco award for outstanding sales achievement during 1940. The award was made at the recent Philco national convention in Chicago.

WHY ALNICO MAGNETS ?



THE characteristic properties of alnico are such that, from the very beginning, General Electric engineers have regarded it as a promising material for watthour meter damping magnets. Experience with its use in many General Electric products has borne out the early predictions.

However, permanent stability of the damping magnet is the one essential that will assure continued accuracy of a watthour meter. A premature decision to use an unproved magnetic material, however attractive, might damage the reputation for sustained accuracy now possessed by General Electric watthour meters.

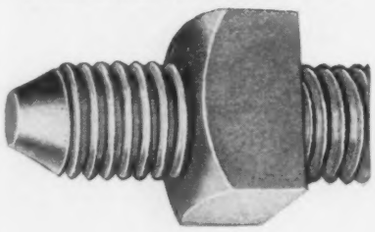
Therefore, the decision to use alnico was made only after a thorough study of all operating conditions, and after conclusive tests had been made over a period of years to prove the magnetic stability of this alloy. Then, processing the alloy and manufacturing the magnets presented many new problems. These have been successfully solved, so that full advantage can now be taken of the excellent properties of this alloy.

Alnico magnets now used in General Electric watthour meters give added assurance of sustained accuracy, under all operating conditions, because of their inherently high resistance to demagnetization.

GENERAL ELECTRIC

601-5

SURE WE DO
"HANDIPOINT"



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Carriage Bolts — Guy Rods

Provides driving head
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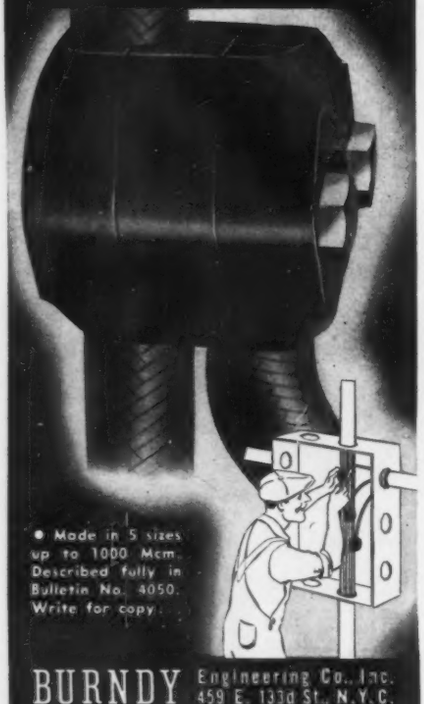

• Made in 5 sizes up to 1000 Mcm. Described fully in Bulletin No. 4050. Write for copy.

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459 E. 133d St., N.Y.C.

MORE MANPOWER FOR DFENSE

HAROLD E. TIVEY, engineering department, Northwestern Electric Co.,—Second Lieut., Coast Artillery, Fort Winfield Scott.

FRANCIS M. FALGE, Studio Lighting Specialist for the Lamp Dept., G.E., Los Angeles — Lieut. Senior Grade USS Arizona.

W. F. "BILL" GRIMES, former manager, Radio Interference Bureau, Los Angeles —Lieut. Commander, 11th Naval Dist. Hq., Los Angeles.

PAUL E. KERANEN, journeyman electrician, Northwestern Electric Co.,—First Lieut., 75th Coast Artillery, Anchorage, Alaska.

BILL NODDER, Pacific Electric Mfg. Co. Corp.—Captain, Coast Artillery, San Francisco.

Sierra-Pacific Power

NORMAN C. BROWN, district superintendent at Carson City—Captain, administrative officer for selective service for Nevada, at Carson City.

Westinghouse

J. K. FAIRCHILD, salesman, San Francisco—Major, Army Industrial College, Washington, D. C.

A. J. STEVENS, salesman, San Francisco —Major, San Francisco Ordinance District.

HARRY A. JOHNSON, Micarta Division representative — Captain, Coast Artillery, Fort Monroe, Va.

B. M. MOREHOUSE, sales assistant—Second Lieut., Infantry, Fort Benning, Ga.

R. E. BLASEN, salesman, Los Angeles—First Lieut., Engineers, Fort Ord, Calif.

L. M. WATSON, lighting specialist, Los Angeles—Lieut. Senior Grade, Naval Aircraft inspector, San Diego, Calif.

LIONEL T. STRONG, sales representative, San Diego — Lieut. Commander, 11th Naval Dist., San Diego.

Demobilized!

Patriotism very nearly crippled the Eklund Electric Co. of San Rafael. Robert Eklund, oldest son of H. R. Eklund, and in charge of the store and office for his father, was a lieutenant in the Marine Corps reserves of San Rafael. In Bob's company were his brother, Arthur, and two more boys from The Eklund shop, Louis Ponti and Tony Palagreni. Came the call to duty. It left Harry Eklund almost demobilized. Quickly he brought his daughter into the firm for the bookkeeping, and store and borrowed another son, Luther, from Westinghouse Supply Co., where he was service repair man. It happened that Arthur had served enough time and was released. So Eklund Electric, pioneer electrical contractor-dealer firm, carries on —but definitely on a war footing.

G. W. FAUROT, sales assistant, Portland —Ensign, Bureau of Ships, Washington, D. C.

DAVID C. FULTON, sales assistant, Seattle—Second Lieut., Engineers, Fort Belvoir, Va.

R. C. DAVEY, sales assistant, Salt Lake City—First Lieut., Infantry, Ft. Francis, East Warren, Wyo.

SMOOT-HOLMAN COMPANY
Pioneers of Lighting in the West

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INGLEWOOD CALIFORNIA
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STEVENS SALES CO.
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Salt Lake City, Utah
G. S. SPANGLER
618 Colorado Bldg.,
Denver, Colo.

I'm no hot shot, *honest...*

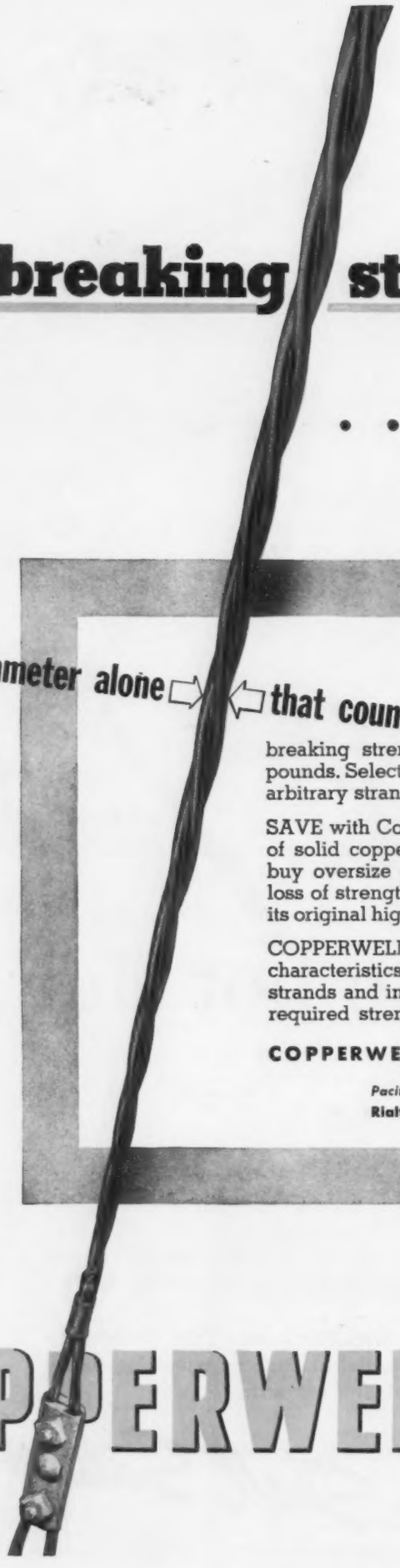
Every once in a while I'm dubbed "a lubrication hot shot," and I'm not one, honest. Now if they'd call me "a good salesman for Safety Factors," that would be more like it. For instance:

The other day, I fixed up a traveling kiln that had been freezin' bearings pretty bad. Yet all I did was suggest a bearing lubricant nobody else had been able to supply those folks.

So what? So I get the credit, when actually it's one of the Shell Safety Factors that did it. Shell has a whole bagful of these money-saving Safety Factors that I'd like to talk to you about. Just say when . . .

Your Shell Salesman

Buy breaking strength and life . . . not diameter



It's not diameter alone ⇨ ⇦ that counts

SAVE with Copperweld's higher breaking strength. Buy smaller diameter and fewer pounds. Select guy strand by breaking strength—not by arbitrary strand diameter—for the job the guy must do.

SAVE with Copperweld's guaranteed rust-resisting life of solid copper. With Copperweld you don't need to buy oversize guy strand as a protection against later loss of strength caused by rust. Copperweld can't rust; its original high strength is permanent.

COPPERWELD ENGINEERING DATA ED-1686 lists the characteristics of all standard sizes of Copperweld guy strands and includes a graphic method of determining required strength of guys. Write for your copy.

COPPERWELD STEEL COMPANY · *Glassport, Pa.*

Pacific Coast Representative: **C. E. INGALLS**
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Transmission and Distribution Line Equipment

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TIME SWITCHES

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NEW OFFICERS FOR UTAH LEAGUE

The Electrical League of Utah elected officers for the coming year Jan. 10: G. Wayne Stillman, president; Edward J. Duggan, vice-president, and Ora H. Barlow, secretary-treasurer.

Stillman, who succeeds Orson John Hyde, is vice-president and general manager of Radio Studios, Inc., appliance dealers of Salt Lake City, Ogden and Logan. Duggan is district manager of WESCO and Barlow, a division sales supervisor for Mountain States Tel. & Tel. Co.

STILLMAN

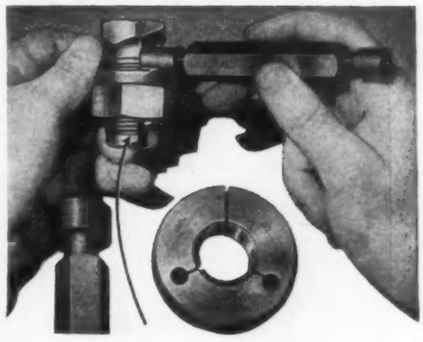
Re-appointed manager was Elias J. Strong, and the following board of trustees was chosen: Duggan, H. W. Eskuche, Western Supply Co., W. R. Widdison, Zion's Cooperative Mercantile Institution; Will O. Smith, G-E Supply Corp., representing wholesalers.

● Sidney W. Green, in charge of the San Joaquin Power Division, P G and E Co., division advertising department, retired from active service Jan. 1, after more than 20 years of service with that company. Starting with San Joaquin Light & Power Co., in December, 1919, Green came to the company with newspaper and advertising experience. He was placed in charge of the department in 1930 and has held the position since.

● Harry C. Donaldson is now chief accountant of Montana Power, the position formerly held by James R. Sullivan, who was made assistant treasurer several months ago.

● Earl Jarvis has joined the Electrical Service League of British Columbia as field representative.

GO, NOT-GO GAUGING



Plus — QUIK-START THREADS *Provides Advantages in your* KEARNEY CON-NEC-TITES

FOR good, tight, permanent electrical connections, that will stay on your lines for years and give trouble-free service, you need uniform, precision built solderless wire connectors.

Kearney Cold Drawn Con-Nec-Tites are uniform — they are held to accuracy by means of "Go-Not-Go" Gauges. No chance of jammed or stripped threads causing hidden losses. Gauging assures proper engagement of nut on all Kearney Con-Nec-Tites.

Quik-Start threads at the end of the lead pilot provide another advantage. Nuts start on the thread with a quick 1/8th turn. Less chances of thread damage — less chance of connectors being destroyed and wasted.

Here are just two features of many that you will recognize to be important in providing protected electrical connections on your lines. And it will pay you to investigate the other features. Ask a West Coast Kearney Representative. **Maydwell & Hartzell, Inc., San Francisco, Los Angeles and Portland.**

JAMES R. KEARNEY

The Mark of Quality Products

UTILITY EQUIPMENT

for BETTER Construction

TRUMBULL

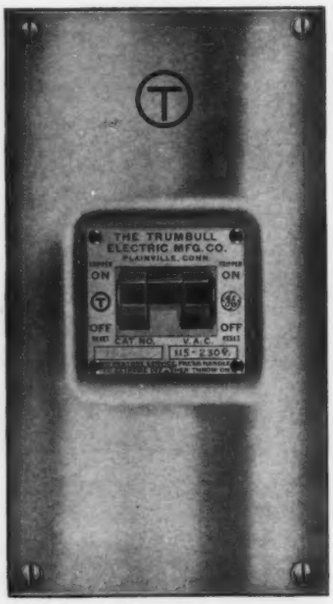
"LAST WORD" CONVENIENCE

costs no more . . .

when you install these ultra-modern Trumbull Multi-Breakers . . . and you assure your customers the advantages of absolute SAFETY, instant restoration of service "with the flip of a handle".

No fuses or other replacements to bother with, and such complete protection and simplicity that even a child can operate them.

CONTROL *and* PROTECT
. . . automatically . . .
LIGHTING CIRCUITS, RANGE, WATER HEATER AND ALL HEAVY DUTY APPLIANCE CIRCUITS, ALSO TO CONTROL MACHINES OPERATED By *Small Motors*



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are available in a very complete range of sizes and combinations to meet every requirement from the smallest cottage home to large residences, apartment houses, stores, offices, commercial and factory buildings, and for the control of small individual motors or high wattage appliances.

Take full advantage of the swing to this new type of service equipment. Write at once for Trumbull Bulletin 323 which will bring you up-to-date on the complete line.

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THE TRUMBULL ELEC. MFG. CO.
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A GENERAL ELECTRIC ORGANIZATION

KEEP *Alert* ELECTRICALLY
use your TRUMBULLAIDS

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ALBERT GOWARD HAS 50 YEAR SERVICE RECORD

A famous old athlete was honored recently in Vancouver. But although speakers recalled his athletic career, it was not for that he was honored, but for completion of his fiftieth year with BC Electric Railway Co.

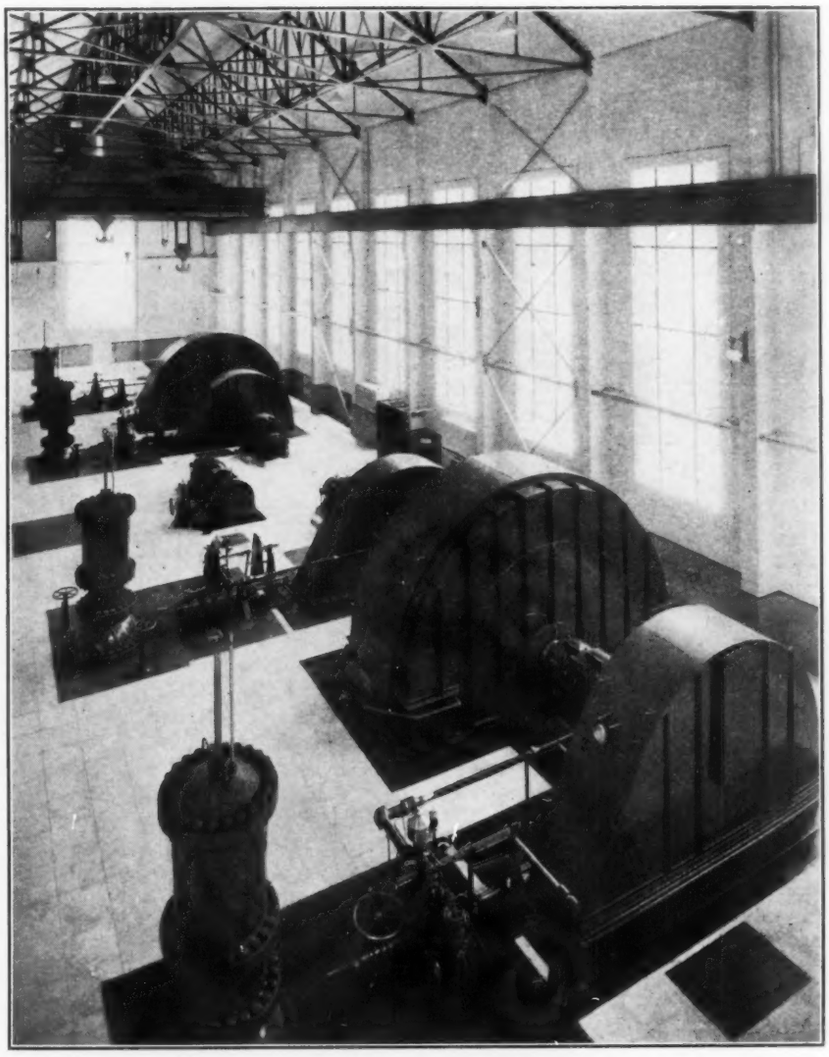
The man honored is Albert Goward, vice-president of the company at Victoria. President W. G. Murrin presided and presented Goward with a silver tray, inscribed with signatures of BC Electric officials.

GOWARD

Goward at one time held the men's open championship in tennis singles, was on a championship soccer team in 1895, and was captain of the Victoria rugby team from 1897 to 1902. During part of that time the team held the provincial championship. Among his present skills: lawn bowling and golf.

● WINDOWLESS PLANT — Decentralized in eleven buildings, the $11,000,000 Douglas Aircraft Co. plant adjacent to Long Beach municipal airport will be invisible at night. This invisibility will be insured by "light traps" and camouflage landscaping. It will be completely air conditioned and lighted electrically. Below ground, there will be storage rooms for planes and materials, as well as bomb-proof shelters for 15,000 employees. This concrete-steel plant is being constructed by the P. J. Walker Co. of Los Angeles from plans by Taylor and Taylor. The buildings are scattered over a 200-acre plot, and will provide almost 1½ million sq. ft. of productive area, which should be ready by next summer.

Hydraulic Power . . Fundamental in the National Defense Program



With production in industry being accelerated to meet the needs of national defense, unprecedented demands for power are anticipated such that the present installed capacity may prove insufficient. Utility executives and engineers are alert to such a possibility and consideration is being given not only to new sources of hydraulic power, but to rehabilitation of the older plants in order to obtain maximum output. In the same spirit of loyalty the experience and resources of this company are offered in meeting the nation's requirements.

THE PELTON WATER WHEEL COMPANY

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BLW THE BALDWIN GROUP

PELTON

Subsidiary of THE BALDWIN LOCOMOTIVE WORKS

● Dr. Adam S. Bennion, assistant to the president of the Utah P & L Co., was principal speaker at a banquet, Jan. 8, honoring six employees of Salt Lake Hardware Co., electrical distributors, who together have served the organization a total of 140 years. Honored were: Harry Lambrecht and J. A. Stanton, 35 years each; Charles A. Carroll, George Albert Hardy and Walter G. Koplin, 20 years each and Russell Harrison, 10 years' service. W. E. Gnadt, general manager, presided.

● George E. Cullinan, Graybar's senior vice-president, retired at year's end. He has many national distinctions, but is most likely to be remembered by Westerners as the 1930 winner of the McGraw Award, as a past chairman of the National Electrical Wholesalers Assn.

● Charles E. Beam, a member of the Port Angeles City Light staff for 12 years, has been named acting superintendent of the Light Department. He will partially fill the vacancy created by resignation of Stewart White, as city utilities superintendent.

William J. Varley, representative of the San Francisco Electrical Contractors' Assn., has been named a director of the Golden Gate Bridge and Highway District by the San Francisco board of supervisors.

● Peter Diehl, who for the last six years has been sales representative of the Phelps Dodge Copper Products Corp. in Northern California, last month joined the sales staff of Allied Industries in San Francisco.

● George Challenger, farm representative in the Fraser Valley area for the B C Electric Railway Co., has been appointed Chilliwack manager in the absence of Lorne R. McPhee, who has left for Toronto where he will serve with the Royal Canadian Air Force. The new appointee has been a resident of Chilliwick since 1935. He was formerly district agriculturist at Kamloops.

DEATHS

● Carl Henry Hoge, 55, engineer for the Puget Sound P & L Co., died in Seattle Jan. 13. He graduated from the University of Illinois in 1909 and during that year joined the staff of the old Seattle Electric Co. He has been with the company since that time, through its change of name to Puget Sound P & L. During that period, he served as assistant superintendent of construction, superintendent of the southwestern division with headquarters in Olympia, superintendent in charge of transmission and distribution for the company, and finally engineer.

● E. A. Portal, former radio and appliance dealer in San Francisco and later in charge of the Radio and Appliance Department of Charles Brown & Sons dropped dead Jan. 16 of heart attack. Of late years he has been in a wine distributing business of his own. While in the radio and appliance field he was noted for his clever action window displays.

● J. Mark Webster, electrical inspector of Fresno, died of heart attack Jan. 20. He had been carrying the work of the chief inspector, Tom Coyle, who has been seriously ill for months. Webster began with San Joaquin Power 40 or more years ago and was well known throughout the San Joaquin Valley.

● H. E. Brunelle, resident representative of Leo J. Meyberg Co., RCA Division, in San Diego, died in that city in November. One of the organizers of the Bureau of Radio and Electrical Appliances, he served as director for several years and was president in 1937.

● Cornelius F. Collonan, electrical contractor-dealer, prominent in San Francisco civic affairs, died Jan. 13, age 56, after a long illness. Born in the Mission district, San Francisco, he worked at various odd occupations—going to sea, and about 25 ago started in the electrical business.

● Alexander Murphy, 57, superintendent of the Barriere River hydro plant of the B. C. Electric Railway Co. at Kamloops, B. C., died on New Year's Eve in hospital in that city following an accident in the plant on Christmas Day. He had been in charge of the Barriere power-station since 1923.

● Alfred V. Guillou, public utilities engineer for the city attorney of Los Angeles, and from 1920-31 assistant chief engineer of the California Railroad Commission, died in December, in Van Nuys, Calif., where he made his home. He will be remembered in many parts of California, having been a native of Ventura, and having become sales engineer for the old Pacific Light & Power Corp., Los Angeles, upon completing the Westinghouse test course at East Pittsburgh in 1914. He was with Mt. Whitney Power & Electric Co. from 1916-19, and his principal affiliation outside the state was with the Public Service Commission of Wisconsin, where he was chief engineer from 1931-33. At the University of California, where he was graduated in 1912, he was a member of Tau Beta Pi.

TRADE *notes*

NEW BUILDING FOR WESTINGHOUSE IN S F

Westinghouse will combine all of its affiliates in a new building to be erected in San Francisco during the year, according to announcement by Charles A. Dostal, Pacific Coast district manager, and R. G. Holtermann, vice-president, Westinghouse Supply. Deal for purchase of the land at the southeast corner of Eighth and Bryant Streets, San Francisco, was announced Jan. 29.

The new building will be the headquarters for the Pacific Coast District of Westinghouse E. & Mfg. and Westinghouse Supply. It will also house the offices of Westinghouse Lamp Co., the X-ray division, the merchandising division, the Westinghouse Elevator Co. and Bryant Electric Co. The manufacturing plant at Emeryville and the service shop there will not be affected.

On an L-shaped lot, 275-ft. frontage on Eighth Street, and 275 ft. deep, with Western Pacific's spur track at the rear, ground area covers 59,000 sq.ft. Building now being planned will have in excess of 100,000 sq.ft. of floor area.

In making the announcement, Dostol declared the Westinghouse Co.'s total investment in the district, comprising seven western states and portions of Wyoming, Montana, New Mexico and Texas exceeds six million dollars and employes more than 1300 employees. Business increase of almost 50% over 1939 was had in 1940 and all facilities of the district have been changed because of this growth. Construction will start later in the year.

Eastabrook Has New Line

H. D. Easterbrook now handles the Allen Bradley Co. line of electrical control equipment in Southern California territory. His office is at 443 South San Pedro St., Room 306. Formerly with the Westinghouse Electric & Manufacturing Co. in its industrial division, he has been active in the Maintenance Engineers' Assn.

● Consolidation of Sovereign Electric Supply Co., San Francisco, and Tri-State Supply Corp., Los Angeles, was effected January 1. No change in management or location of either firm was involved.

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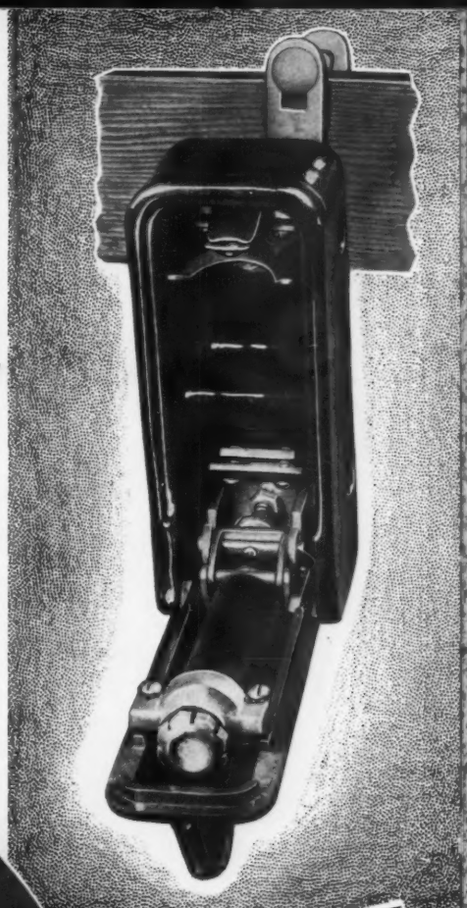
ote the OUTSTANDING ADVANTAGES found only in R&IE Type KOT CUTOUTS



ENCLOSED TYPE EKOT

Here too, is the characteristic R & I E simplicity of design. Features Hi-Pressure silver contacts with beryllium copper back-up springs. Few parts enclosed in heavy duty porcelain housing. Advantages are offered in the use of the R & I E Thermo-Rupter, but the cutout will operate with any universal type link. Furnished with sturdy, galvanized mounting hanger with half-inch bolts.

1 to 100 Amperes
5,000, 7,500 and 15,000 V.

OPEN TYPE 2-KOT

Why not consider these important facts when you want a dependable cutout. Here you have adjustable Hi-Pressure spot contacts, with each of two hinge castings working independently to insure equal pressure on each contact—double clamp type terminal with half inch bolts—visual indication—Thermo-Rupter link but will use any universal type—and a quick and easy method of reloading.

1 to 200 Amperes
7,500, 15,000 and 23,000 V

about it—Get your copy of BULLETIN D2

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GREENSBURG, PA. . . . IN CANADA, EASTERN POWER DEVICES, LTD., TORONTO.

Use More DROP FORGED Pole Line Hardware And Obtain ★

1 Plus Strength in Lighter Sectional Thicknesses.

2 Uniform Physical Structure, Size and Shape.

3 Freedom from Concealed Defects.

4 Extra Margin of Safety.

Forgings offer many direct and indirect economies. Consult makers of drop forged pole line hardware.

DROP FORGING ASSOCIATION

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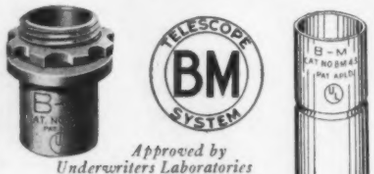
STRONG, NEAT CONNECTIONS EVERY TIME!

When You Use B-M Connectors and Couplings



Approved by Underwriters Laboratories

You welcome the speed and ease that the B-M system puts in your hands. These fittings give you complete, **well finished** work in a hurry—on all average jobs (they're non water-tight).

Only One Tool Needed!

Costs you only $1.25 for the patented B-M indenter (½"—handles 80% of all installations). Just two squeezes, and you have a smooth, neat connection. No other tools required. This tool can save you many times its cost on the first job.

POPULAR—because it's the SIMPLE METHOD! Saves 25% on material, save 25% to 50% of connecting time. Makes installations quick and easy. Eliminates complications and ends fussing with nuts to tighten.

Distributed by

The M. B. Austin Co. Chicago, Ill.
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National Enameling & Mfg. Co. Pittsburgh, Pa.
Triangle Conduit & Cable Co. Elmhurst, New York City

BRIEGEL METHOD TOOL CO., Galva, Illinois

● B. F. Bowers, manager of Tri-State Electric Equipment Co. of Los Angeles, has puchased the Sovereign Electric Co. of San Francisco to form the nucleus of an expansion of Tri-State Co. in northern California.

● Hockensmith Sales, 443 South San Pedro St., Los Angeles, has been appointed representative of B & S Body-Glo electric wall heater, manufactured by Bauer Manufacturing Corp., 7006 Sanford Ave., Los Angeles, as well as the Heffe portable plater.

● D. E. Sanford Co., on Dec. 16, purchased a building at 1049 South Hill St., Los Angeles, and forced the remodeling contractor to break speed records in order to move in on Dec. 30. The building has two floors and balcony with 12,000 sq. ft. of space for offices, showroom facilities, shipping and warehousing all under one roof. With other offices at San Francisco, Seattle, Portland, and Honolulu, according to D. E. Sanford, its sales department was augmented with a trained staff of dealer men and floor demonstrators, adding 86 to the regular force during the holiday season, all of whom will remain on the payroll throughout the year.

● James H. Cannon celebrated the 25th anniversary of the opening of Cannon Electric Development Co. as a two-man electric specialty shop which has grown into a new and enlarged plant at 3209 Humboldt St., Los Angeles, now employing 400 workers. Manufacturers of cable connector fittings, electric signal systems and specialties of that type, the new plant and all mechanical equipment was moved in in 90 days while production was maintained 400% above 1939 average.

● AN OLD-FASHIONED WATER WHEEL is being used at Starbuck, Wash. to operate a 2,300-volt electrical plant which serves about 30 customers. The plant has been in operation since 1907.

● MERCURY and incandescent are combined in eight new luminaires installed by the city of Oakland at the east and west ends of its Civic Auditorium, according to word from Ben C. Hill, superintendent, electrical division.

CONTRACTS AWARDED

TO GENERAL ELECTRIC CO., $41,069 for six 3,333 kva. transformers for the Tacoma, Washington Board of Contracts and Awards.

TO ALLIS-CHALMERS, $20,316 for three 1,500 kva. and three 1,000 kva. transformers for the Tacoma, Washington Board of Contracts and Awards.

To LENTS, INC., Bremerton, Wash. $37,207, for 600 six-cubic-foot electric refrigerators for the Bremerton housing project at Westpark.

To WESTERN PIPE AND STEEL CO., of Calif., $1,587,000 for four penstocks for Shasta Dam.

To G-E, $301,080 for six oil circuit breakers and oil for Grand Coulee Dam.

To THE RAILWAY & INDUSTRIAL ENGINEERING Co., $114,500 for disconnecting switches for Grand Coulee Dam.

To ALUMINUM CO. OF AMERICA, $635,367 by Bonneville project for conductor and accessories for Covington-Coulee transmission line.

To ANACONDA WIRE & CABLE CO., $124,238, for 350 hollow copper cable for 100-mi., 115 kv. transmission line from Elephant Butte power plant to Southwestern New Mexico, by Bureau of Reclamation.

To MOORE ELECTRIC CO. of Los Angeles, $220,826, for a power system for new machine shop building at Mare Island Navy Yard.

To HOMER G. JOHNSON of Portland, Ore., $55,230.60 for building 58 mi. of line to serve 235 members of PUD No. 1 of Klickitat County, Wash., and REA project.

To SNYDER & JOHNSON, INC., of Iowa, $254,037.17 for building 387 mi. of line to serve 736 members of the Poudre Valley Rural Electrical Assn., Severance, Colo., and REA project.

To H. A. RISK PIPE & CONSTRUCTION CO. of Nebraska, $68,616.47 for building 85.8 mi. of line to serve 257 members of the Empire Electric Association, Inc., Dove Creek, Colo., an REA project.

To LESSINGER PLUMBING & HEATING CO., of Boise, Idaho, $61,404.50 for building 86.5 mi. of line to serve 214 members of the Lost River Electric Cooperative, Inc., Arco, Idaho, an REA project.

To PETER KIEWIT SONS CO. of Omaha, Neb., $150,394.76 for building 166 mi. of line to serve 453 members of the Big Horn County Electric Cooperative, Inc., of Hardin, Mont., an REA project.

To NEWPORT CONSTRUCTION CO. of Portland, Ore., $52,756.09 for building 93 mi. of line to serve 69 members of the Malheur Cooperative Electric Association, Vale, Ore., an REA project.

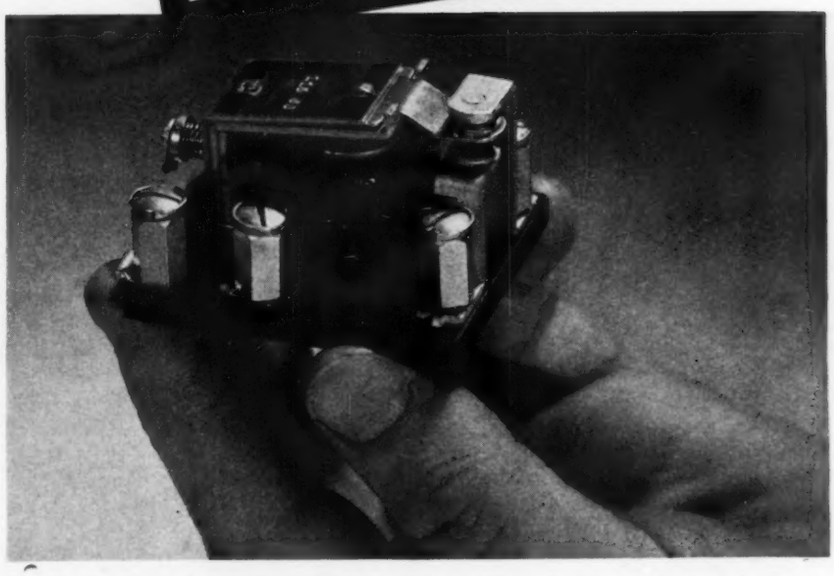
To PETER KIEWIT SONS CO. of Omaha, Neb., $75,993 for building 122 mi. of line to serve 207 members of the Riverton Valley Electric Association, Inc., Riverton, Wyo., an REA project.

To INLAND CONSTRUCTION CO. of Omaha, Neb., $100,720.86 for building 149.4 mi. of line to serve 153 members of the Rural Electric Co., Pine Bluffs, Wyo., an REA project.

To MOTT ELECTRIC, LTD., of Vancouver, B. C., $210,000, a sub-contract for the electrical installation in the new elementary flying training school under construction at Boundary Bay.

To JARVIS-FIRTH ELECTRIC, LTD., of Vancouver, B. C., a sub-contract for the electrical installation in the central heating plant of the Department of Munitions and Supplies at Kamloops.

THIS RELAY IS SMALLER HUSKIER AND COSTS LESS!



The design of the new Ward Leonard Little Giant Single Pole Relay is simplicity itself. It is sturdily built yet there is not an ounce of material in it that is not essential to efficient performance. Measures only 1 7/8" x 2 5/8". Controls 3/4 H.P. on 115-230 volts. Ideal for heaters, pumps, compressors, signal lights, etc. Send for bulletins.

WL **Relay Bulletins**

Little Giant Relays	Bulletin 105
Midget Relays	Bulletin 106
Intermediate Duty Relays	Bulletin 81
Heavy Duty Relays	Bulletin 131 & 132
Sensitive Relays	Bulletin 251
Time Delay Relays	Bulletin 351 & 362

WESTERN REPRESENTATIVES

Raymond Ackerman, 318 Dooly Block, Salt Lake City, Utah
Northwestern Agencies, 2411 First Avenue, Seattle, Wash.
A. R. Slimmon, 445 East 3rd Street, Los Angeles, Calif.
Electric Material Co., Inc., 163 2nd Street, San Francisco, Calif.

WARD LEONARD ELECTRIC COMPANY

Electric Controls Since 1892

Ward Leonard Electric Co., 48 South Street, Mount Vernon, N. Y.
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INDEX TO ADVERTISERS
February, 1941

Allis-Chalmers Mfg. Co. 6, 7
Aluminum Company of America ... 27
American Steel & Wire Co. 97
Anaconda Wire & Cable Co. 107
Brewer-Titchener Corp. 99
Briegel Method Tool Co. 128
Bull Dog Elec. Products Co. 25
Burndy Engineering Co., Inc. .106, 108, 120
California Oregon Power Co. 82, 83
Chance Co., A. B. 118
Chicago Flexible Shaft Co. 14
Columbia Steel Co. 97
Copperweld Steel Co. 122
Crescent Ins. Wire & Cable Co. 4
Crocker First National Bank 10
Driver-Harris Co. 14
Drop Forging Assn. 128
Electrical Testing Labs 8
Everstick Anchor Co. 106
Fast & Co., John E. 31
Frigidaire Div., General Motors Sales Corp. 36, 37
Gardner Elec. Mfg. Co. 104
G. C. A. Mfg. Co. 104
General Electric Co.
Bridgeport 11, 23, 24, 85
Cleveland 90, 91
Schenectady..1, 39, 110, 111, 114, 119
Hazard Ins. Wire Works 40
Honn Co., Geo. E. 104
Hotpoint (Edison G-E Appliance Co.)
Calrod 9
Range 12, 13
Water Heater 15
Hubbard and Company 35
Idaho Power Company 82, 83
Ideal Commutator Dresser Co. 14
Illinois Elec. Porcelain Co. 109
Indiana Steel & Wire Co. 112
Jeffries Transformer Co. 108
Johns-Manville Corp. 116, 117
Kearney Corp., James R. 113
Kelvinator Div., Nash Kelvinator Corp. 18, 19
Klein & Sons, Mathias 102
Kortick Mfg. Co. 120
Kuhlman Electric Co. 103
Landers, Frary & Clark 80
Line Material Company 3, 105
Maydwell & Hartzell, Inc. 104, 123
Modern Kitchen Bureau 17
Montana Power Company 82, 83
Okonite Company, The 40
Okonite-Callender Cable Co., The .. 40
Pacific Coast Elec'l Bureau ...4th Cover
Pacific Elec. Mfg. Corp. 5
Pacific Gas and Electric Co. ..3rd Cover
Pelton Water Wheel Co. 125
Penn-Union Elec. Corp. 26
Pittsburgh Reflector Co. 28
Portland General Electric Co. 82, 83
Puget Sound Power & Light Co. ..82, 83
Railway & Industrial Eng'g Co. 127
Reliable Electric Co. 30
Rocky Mountain Elec'l League 82, 83
Schweitzer & Conrad, Inc. 29
Shell Oil Company 121
Smoot-Holman Co. 120
So. Calif. Edison Co. Ltd .....2nd Cover
Square D Company 33
Tork Clock Co., The 8
Trumbull Electric Mfg. Co. 124
United States Steel Corp. 97
Utah Power & Light Co. 82, 83
Wagner Electric Corp. 32
Ward Leonard Elec. Co. 129
Westinghouse Elec. & Mfg. Co.
Cleveland 87
Mansfield 20, 21
East Pittsburgh 93, 94
Weston Elec. Instrument Corp. 38
Wiegand Co., Edwin L. 10

PROFILES *of the month*

Here are the men who handle Wiremold sales on the West Coast, (left to right) Frank J. Airey, Los Angeles; F. A. Strohecker, Seattle, and George A. Gray, San Francisco. The three district sales managers started off the year by attending Wiremold conference at Hartford, Conn.

An aluminum alloy bus fitting for Bonneville is being examined at Pacific Electric Mfg. Corp. plant by (L. to R.) Henry Brooke, sales manager, and Bill Poynter

J. F. Emery qualified for an author's picture when he wrote in the July, 1940, Electrical West. So here it is. He is assistant distribution superintendent for Idaho Power

Paul Puffer (center) is general sales manager for the Norge Division, Borg-Warner Corp. Norge distributor in San Francisco is the Leo J. Meyberg Co., Inc., which is represented above by (left) Manfred Meyberg, vice-president (brother of Leo J.), and by Al Meyer, president

Preview of coming campaigns by

P·G·and E·

for the

FIRST TIME IN HISTORY

AN HONEST-TO-GOODNESS, ALL-INDUSTRY CAMPAIGN ON ELECTRIC RANGES AND WATER HEATERS

featuring

$30 OFF ON RANGES
$10 OFF ON WATER HEATERS

Now, for the first time, P.G. and E. can throw the full weight of its powerful advertising behind electric ranges and water heaters in a real system-wide* campaign—with every dealer telling the same story!

Old timers predict a walloping big increase in unit sales and in net profit to the dealer.

**San Francisco excepted.*

102-241

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Electric Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Electric Appliance Society, 1355 Market St., San Francisco, Calif.

1914

1941

LET'S LOOK THROUGH JANUS' EYES

Janus was an ancient Roman god. Wisely, he did not limit his vision to a single line, but faced in two directions.

Facing into 1941 we see a dark outlook—wars and rumors of wars—chaos and more chaos in the making—the primary job of every man, the defense of his country.

But with Janus' eyes, we can look back into the past too. And in looking back we see another time when we had a black outlook. That was in 1914, with the world halted in its tracks and the war beast rampant.

But 1914 passed, and the ugly years of war that followed it. The war ended, and in the 20 years that followed, we came to undreamed heights of accomplishment.

This look backward should inspire us with optimism when we look forward into 1941. We are threatened again with grave danger. We must be prepared to meet it. The National Defense program is the duty of first importance to America.

But one of these days the emergency will be past, the storm will be weathered, and America will go on once again to still greater accomplishments.

So even while we are thinking and acting today in terms of national defense against a possible aggressor, we must also keep our eyes on the eventual goal—the welfare of our great civilian population and the defense of the American standard of living.

We in the electrical industry are fortunate. In the course of our everyday work we can promote the defense of our country because our industry is a basic one, essential to the defense program. And at the same time we can be progressing toward our greater goal—the goal of better living that includes comfort and convenience—better living that depends largely on service provided by the electrical industry.

PACIFIC COAST ELECTRICAL BUREAU

601 WEST 5TH STREET LOS ANGELES • 447 SUTTER STREET SAN FRANCISCO

CERTIFIED ADEQUATE RED SEAL STANDARD WIRING

2-41